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AMERICAN ARTISAN and Hardware Record

Vol. 82. No. 14.

620 SOUTH MICHIGAN AVENUE, CHICAGO, OCTOBER 1, 1921.

\$2.00 Per Year.

NIAGARA

A Powerful Warm Air Heater

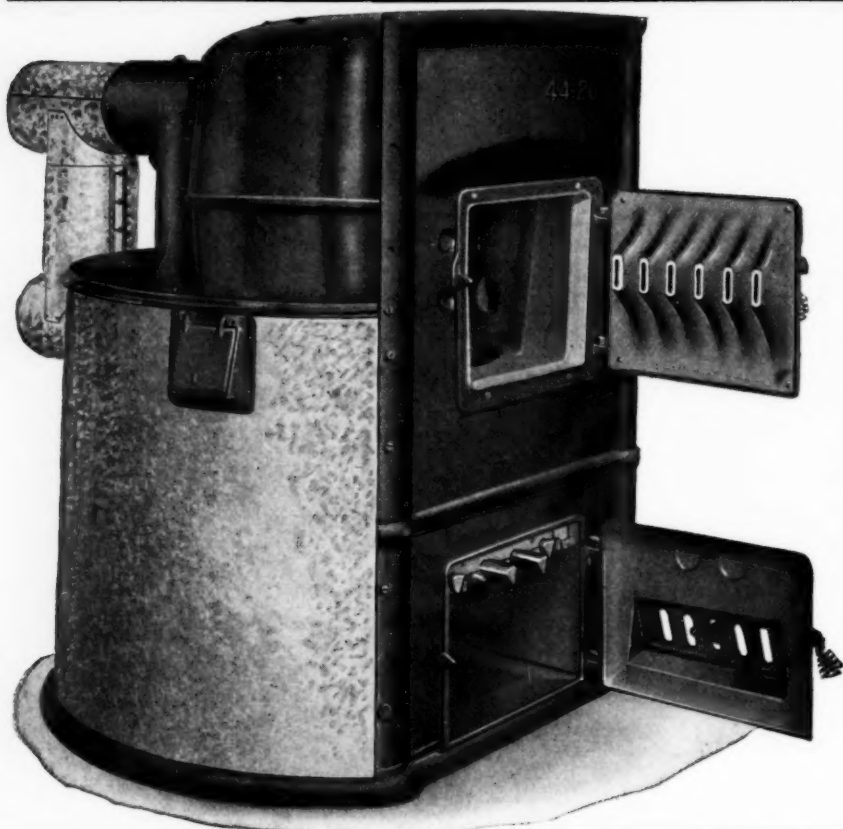


IF you want to sell a warm air heater that is big, strong, heavy and a powerful generator of warm air, the Niagara is the heater that conforms to your idea of a long lasting and great service giving heating plant.

The Niagara is strictly high grade in all respects. It has many features of construction which give it exceptional durability. Write today for our illustrated catalog which tells about it in detail.

Forest City Foundry & Mfg. Co.
Cleveland, Ohio

THE THATCHER *Smokeless*



That NEW heater

with many new and important features. Do you see that extra large combustion chamber? Do you see that lift door on the side which opens into the chamber? There's one on each side. Now then notice also that

New Air Mixing Carbureter

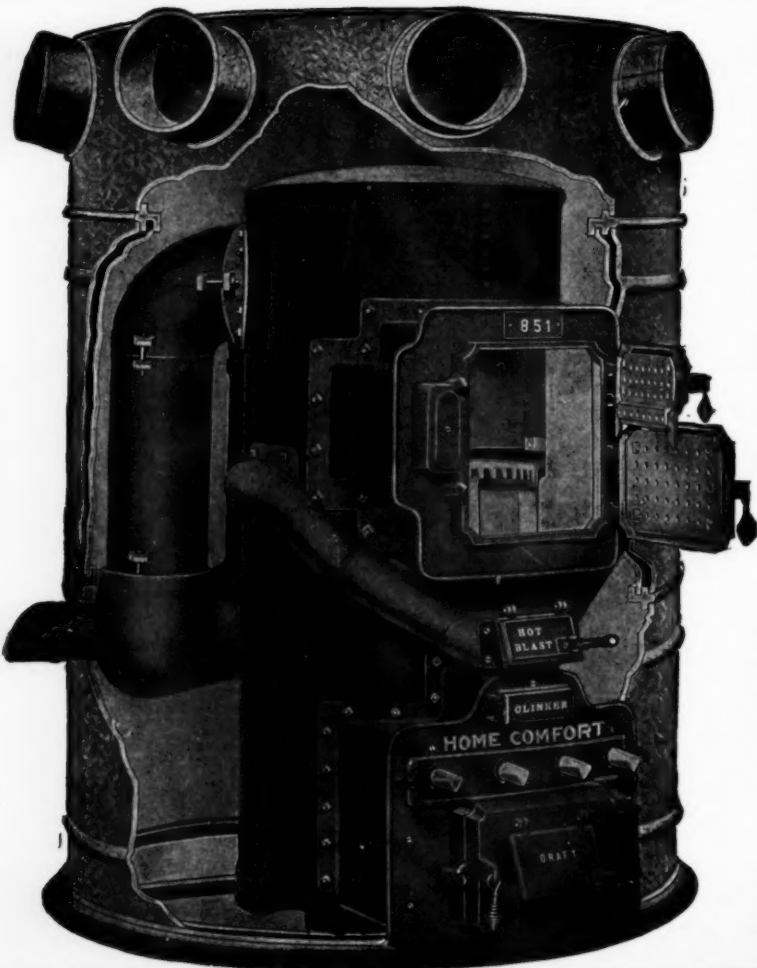
attached to the feed door which allows the proper amount of air to enter the combustion chamber.

These and many other new features make this Thatcher Smokeless Warm Air Heater a real live high grade heating apparatus. The kind you want to sell and the kind that your customers will buy.

Write today for prices, circulars and agency information

THATCHER FURNACE CO.

341 N. Clark Street, CHICAGO, ILL.
133-135 W. 35th Street, NEW YORK, N.Y.



"HOME COMFORT"

THERE ARE NO BETTER WARM AIR HEATERS

THE dealer who sells "Home Comfort" warm air heaters sells heaters that are not only exceptionally reliable but distinctively well made.

An examination of the ALL STEEL construction of "Home Comfort" warm air heaters will reveal to you an unusually well designed heating apparatus.

*For many years they have been
real money makers*

The members of this new company are men who have been connected with the original makers for more than twenty years.

We have a splendid exclusive agency sales plan to offer you.

Let us tell you all about it.

Write today for our catalog

ST. LOUIS HEATING CO.

2400-36 COLEMAN ST.

ST. LOUIS, MO.

FOUNDED 1880
BY
DANIEL STERN
Thoroughly Covers
The Hardware, Stove,
Sheet Metal, and Warm
Air Heating and Venti-
lating Interests

AMERICAN ARTISAN and Hardware Record

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remittances to
AMERICAN ARTISAN
AND
HARDWARE RECORD
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CHICAGO, OCTOBER 1, 1921.

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WHO IS LIKELY TO GET THE BUSINESS?

Some manufacturers are working hard to secure business, some are using every possible opportunity to obtain new customers, some are spending money for trade paper advertising, some are using direct mail campaigns, some are boosting their salesmen to much greater efforts, some are making use of all or several of these methods—

And are being rewarded for their efforts.

Others have evidently made up their minds that there is no business, and that it is useless to spend even a two-cent stamp in the endeavor to make a customer and if a "lead" furnished to them without any expense or obligation on their part—

Witness the two letters in the following:

"We beg to thank you sincerely for your favor of the 21st and your kind recommendation to your subscriber, Mr. _____. We have written to Mr. _____ and trust that our recommendation and our letter will be remunerative of results.

_____."

"We are in receipt of your letter of September 21st and note that you have referred Mr. _____, _____, to us a manufacturer of _____.

"We thank you very much for your interest and assure you that any inquiries from the above person will be given our best attention.

_____."

Both letters, you will note, express gratitude on the part of the recipients for the information furnished that So-and-so was in the market for a certain article.

The first manufacturer gets right on the job and forwards the necessary information.

The second manufacturer answers us that "any inquiries received from the above per-

son will be given our best attention."

Who is likely to get the business?

The concern who goes after it and without delay?

Or the concern who waits for a direct inquiry?

To whom would you be likely to give the order?

It would seem that in times like these any one who has a "lead" furnished to him in such a manner and of such a character would follow it up right away.

Of course, it is barely possible that the concern who is waiting for the direct inquiry has all the business it can attend to and that for this reason it did not care to fill an order from somebody who is not on its list of customers.

It is also possible that this concern does not believe in advertising—and, of course, sending a letter containing information as to sizes and prices, without a previous direct request for such information, can not possibly be classed as anything but advertising.

And yet, this same concern will employ traveling salesmen, pay them good salaries with commission on new business, send them out on the road and "call" them if they fail to develop such new business!

The consistency of some people is something wonderful.

And the way in which some people let opportunities for new, profitable business pass by because of their failure to see the obvious is something still more wonderful.

In fact, it is almost criminal negligence in these days.

We feel almost like apologizing to our subscriber for having given him the name and address of the second manufacturer.

Random Notes and Sketches

By Sidney Arnold

An event of great importance to the present status and future history of the warm air furnace trade occurred September 19th at 365 East 57th Street, Chicago, Illinois, the home of Joseph Goldberg, sales representative Excelsior Steel Furnace Company, Chicago.

On that day a son was born to carry on the name of Goldberg and double the uncommonly big sales record of his father.

* * *

A distinctly happy vibration has spread itself throughout the farthest reaches of the territory covered



E. C. Taylor.

by the members of the Traveling Salesmen's Auxiliary to the Master Sheet Metal Contractors' Association of Wisconsin.

It comes from a focus of joy originating in the marriage of Ernest C. "Buck" Taylor, President of the Auxiliary, to Miss Clara Vivian Chadima, daughter of Mrs. Mary Chadima, which took place Wednesday, September 28th, in St. Paul, Minnesota.

As sales representative of the Rudy Furnace Company, Dowagiac, Michigan, he has won a host of friends by his sunny temperament, obliging disposition, and conscientious service.

If he has an enemy anywhere in the universe, it is some disgruntled dyspeptic who resents the optimism of his nature.

It was the magnetism of his qualities which first attracted the attention of his bride and which helped to win for him so precious a prize.

* * *

It is well to estimate the intention rather the words in some circumstances, says J. Harvey Manny of Manny Heating Supply Company, Chicago, Illinois. He illustrates his meaning with this brief example:

"Friends," apologized the minister, "I have unintentionally left my notes at home. I will make a few extemporaneous remarks, trusting to the Lord for guidance. But tonight I shall come better prepared."

* * *

Legally, there is no room for the enactment of the scene described by O. P. Schlafer, Appleton, Wisconsin, President Wisconsin Hardware Mutual Fire Insurance Company.

Actually, however, similar scenes are not wholly a thing of the past. Here are the details, in brief:

The party had been circumventing the Eighteenth Amendment. Stopping in front of a residence, one

of them pulled the doorbell uncertainly. A window was thrown open above.

"Mishish Brown," called up the spokesman, "wou-joo mind comin' down and pickin' out Mishter Brown from ush? Those that aren't him wanten go home."

* * *

My thanks are herewith expressed to Julius Gerock of Gerock Brothers Manufacturing Company, St. Louis, Missouri, for the fun I got out of this story:

Two powerful colored stevedores, who had some sort of falling out, were engaged in unloading a vessel at a St. Louis dock.

Uncomplimentary remarks and warning of intended violence were exchanged whenever the two passed each other with their trucks.

"You jest keep on pesticatin' around wid me," declared one of the men, "an' you is gwine be able to settle a mighty big question for de scientific folks."

"What question dat?" asked the other.

"Kin the dead speak?"

* * *

The man who never studies his trade or business with a view to progress has as much chance to gain a reputation as the boy in the story told by Harry W. Neal of the Hall-Neal Furnace Company, Indianapolis, Indiana:

One of the attractions at the county fair was a fortune teller's tent. A woman had taken her son inside and the seeress bent over the crystal ball.

"Madame," she murmured in deep, mysterious tones, "your son will be a noted man if he lives long enough."

"How wonderful!" breathed the lady. "What will he be noted for?"

"For his old age."

* * *

Business would soon be bankrupt if all customers settled their accounts in the manner of the Mrs. Tarley, about whom the following story is told by George B. Carr of Carr Supply Company, Chicago, Illinois:

When the agent brought Mrs. Tarley her fire insurance policy he remarked that it would be well for her to make her first payment at once.

"How much will it be?" she asked.

"About \$100. Wait a minute and I'll find the exact amount."

"Oh, how tiresome!" she exclaimed. "Tell the company to let it stand and deduct it from what they will owe me when the house burns down."

* * *

Get Out of the Woods.

No matter how punk the outlook is;
Don't lay down on the job,
Just around the corner a fellow waits,
A happy-go-lucky gob.

Who'll slouch right in and take your place,
With neither regret, nor care,
A peppy, plucky, happy gob,
Whom you'll meet most anywhere.

No matter how rotten the outlook is;
Somebody wants your goods;
So grab your samples, start afresh,
Seek the open, avoid the woods.

Where shadows lengthen early,
And moss clings to fallen things
Go out in the sun of the morning,
And you'll see what the bright noon brings.

—Carlotta Bonheur Stearns.

The Week's Hardware Record

*What Retailers, Jobbers, and Manufacturers Are Doing.
Latest Selling Methods. Experiences of Successful Men.*

LOOKS FOR A BIG ATTENDANCE AT ATLANTIC CITY CONVENTION.

A letter for W. D. Biggers, president American Hardware Manufacturers' Association, to the members states that a big attendance is expected at the joint convention of that organization with the National Hardware Association, October 17, 18, and 19, 1921, in Atlantic City, New Jersey.

"We believe that every manufacturer is anxious to meet as many of his jobber friends as possible, to talk over with them conditions as they exist in their various territories," the letter declares. "No doubt every jobber will desire to talk with the various manufacturers and learn their opinion of manufacturing conditions.

"Our programs, for both the executive sessions of the Manufacturers' Association and the joint sessions with the jobbers, have been arranged to bring out just as much information as possible, covering the present situation.

"In our executive sessions, we will have reports from various committees. We do not want these to be perfunctory committee reports but we want each member to be prepared with suggestions, questions or information covering any of the various functions that our Association should perform and to come to our Association meeting prepared to contribute something in the way of information, discussion, constructive criticism or helpful suggestion. If this is done by all manufacturers, we should go home from that Convention feeling very much better fortified to go into the coming year.

"We are making a departure in the arrangement of our program this year. Our opening joint session will be held Monday evening at eight o'clock. As far as possible, all members should endeavor to attend this opening session. Tuesday morning, each of the associations will have opening executive sessions. Tuesday afternoon, there will be four or five joint group meetings and each member of our Association will attend the meeting most appropriate to his particular line. These meetings will be attended by both jobbers and manufacturers, and matters of immediate interest to the group will be freely discussed.

"At the Wednesday sessions, which will be executive, matters that come up for discussion at our joint meeting with the jobbers will be further discussed. We are not expecting 'speeches' from any of our members. We want good, short, snappy talks on the various phases of our business conditions and what we can do to help right conditions."

Don't become antiquated in your business methods; don't let your customers see that younger men are more energetic, more up-to-date than yourself.

Meeting of Indiana Hardware Men Favors Price Reduction.

That the policy should be adopted of cutting retail prices as rapidly as the wholesale prices decline, regardless of losses incurred on stock bought at high prices, was the unanimous opinion of Indiana hardware dealers at a group meeting in Columbus, Indiana, September 21st.

Fifty dealers from Bartholomew, Brown, Shelby, Johnson, Jackson and Jennings counties attended the conference, which was held at the Chamber of Commerce. Addresses were made by D. Wray DePrez, of Shelbyville, president of the Indiana Retail Hardware Association; G. F. Sheely, of Argos, secretary of the state association, and J. Helgeson, field director.

Extracts from a speech of H. P. Sheets, secretary of the National Retail Hardware Association, were read, in which the speaker criticized several publications for cartoons depicting retail dealers as holding up prices.

It was asserted that hardware men have been passing all price reductions to the consumer. It was also said that in many instances retail dealers took heavier losses than necessary in an effort to get business conditions back to normal.

Organize New Steel and Wire Company.

The G. F. Wright Steel & Wire Company, Worcester, Massachusetts, has been organized and incorporated under the laws of that state with a capital stock of \$100,000 by interests formerly identified with the Wickwire-Spencer Steel Corporation, Worcester and Buffalo.

The company will make poultry netting, wire cloth, wire lathing and wire rope.

George F. Wright, formerly a vice president of the Wickwire-Spencer Steel Corporation, is to be president of the new company; Herbert N. Wright, former treasurer of the Wright Wire Company, is to be treasurer and clerk; Albion B. Pevey, formerly southern representative of the Wright Wire Company is to be general sales manager and Albert S. Knapp, a mechanical engineer, designer of the company's machinery.

The company is to purchase the land and buildings of the Standard Plunger Elevator Company in Worcester.

Hardware Insurance Company Changes Headquarters.

The Texas Hardware and Implement Mutual Fire Insurance Company of Fort Worth, Texas, has filed an amendment to its charter in the state department of insurance and banking, changing its headquarters to Dallas, Texas.

Good Ideas for Window Display

Practical Lessons from Exhibits in AMERICAN ARTISAN AND HARDWARE RECORD Window Display Competition. How to Get More Passers-By to Come into Your Store.

MAKES GOOD WINDOW DISPLAY OF GARAGE HARDWARE.

Recent statistics show that more garages have been built in the past two years than homes.

No matter what breeders of horses may proclaim to the contrary, the automobile is daily coming into wider use.

Not only the wealthy and middle-class divisions of the American people own motor cars, but a constantly growing percentage of working people are buying automobiles.

Consequently, there is practically no limit to the possibilities of sales of garage hardware throughout the United States.

Unfortunately, however, much of the garage hard-

"The remainder of the floor was covered with dark green crêpe paper to represent the lawn on either side of the garage.

"The four cards were a light tan, lettered in brown. The combination of colors in the middle was harmonious and produced a pleasing impression.

"The garage hardware was displayed on either side, and a simple display of butts, hinges and pulls was arranged in the center and side fronts."

It will be noted that prominence is given in this window display to a well established, widely advertised, and favorably known line of garage hardware. The store thus gets the benefit of good will already engendered and developed through continuous general advertising.

Worthy of special notice is the text of the large



Window Display of Garage Hardware, Designed and Arranged by Miss Edna L. Jenison for Peterson Brothers, Incorporated, 7905-7 Third Avenue, Brooklyn, New York.

ware is sold by department stores, lumber yards, and other establishments outside the regular field of retail hardware business.

This undesirable state of affairs is due largely to the backwardness and indifference of many hardware dealers in the matter of stocking garage hardware and pushing its sales.

There is timeliness, therefore, and, indeed, impulse of example in the window exhibit of garage hardware shown in the accompanying illustration.

This display was designed and put in place by Miss Edna L. Jenison, for Peterson Brothers, Incorporated, 7905-7 Third Avenue, Brooklyn, New York.

As described by Miss Jenison, the background for the display was a wall paper frieze of pines and birches in natural colorings, giving the effect of distance and out-door atmosphere.

"The garage cut-out was placed in the center of the window about eight inches from the background.

"The floor of the window across the front and through the middle up to the garage was covered with a light gray crêpe paper to represent the street and a cement runway to the garage.

cards on either side of the central display.

The argument for the use of garage door holders is set forth convincingly in the fewest possible words, namely, "Prevent Accident, Keep the Doors from Slamming Against Your Car."

Gets Trade-Mark Registered in Patent Office.

Under number 147,147, United States Patent Office registration has been granted to the Wickwire Spencer Steel Corporation, Worcester, Massachusetts, for the trade-mark reproduced herewith.



The particular description of goods to which it applies is bottle and jar openers, egg whips and beaters, flour-sifters, fruit-pickers, kitchen forks and spoons, parers, potato and vegetable mashers, and rug-beaters. Application for registration was filed May 2, 1921, and the Company claims use of this trade-mark since 1908.

To Make Tool Sales Grow, Window Display and Newspaper Advertising Is Necessary

*It Takes Special Effort to Sell Tools, Says Jerry,
But the Special Effort Pays Well in Extra Profits.*

Written for AMERICAN ARTISAN AND HARDWARE RECORD by Jerry Gerlock, Hardware Merchant.

The selling of tools in the down-town district of a large city is a somewhat different proposition from that of the small or medium sized town, for the reason that a large portion of the sales in the store in a large city is made to transient buyers, while in the town just the reverse is true. Here the great majority of buyers are regular, everyday, or at least every month, customers.

For that reason, I believe that the kind of advertisement that is shown herewith is not suitable for the hardware store in the small city, while it may be just the thing in the big city.

A lot of people will no doubt be attracted by such an advertisement and many sales will undoubtedly be made as a result—whether it be in the small or in the large city.

But I know from experience that it does not work out well in a small town to quote cut prices on regular items for a short, specified period and then put these items back in stock at their regular prices—too many are apt to be offended because they feel that if a Bailey plane, for example, is offered on Friday and Saturday at \$3.59 and they are prevented by circumstances from attending this sale, they should be entitled to come out the following Tuesday and get it at that price—which of course you couldn't allow as such a procedure would practically mean that \$3.59 would be the "regular" price from that time on. In the large city that question does not come up, because there it is quite well understood that a cut price holds good only for the time given in the advertisement.

On the other hand, I do know that the hardware store in any sized town or city which makes it a rule

to advertise regularly will sell many more tools than the occasional or non-advertising store—and enough more to justify the investment in newspaper space or circulars.

And it is not at all necessary to quote cut prices in order to attract trade—that has been demonstrated time and again.

On the other hand it is good policy to illustrate and give short—not too technical—descriptions of several tools, accompanied by the quotation of definite prices, because most persons prefer to know something about the cost of the particular kind of tool before they come to the store.

And keep this in mind, at this time especially, that you can quote "reductions" because in practically every instance your prices of today are lower than they were three months ago.

Many people can be induced to buy tools now for two reasons:

First, because they want to save money on the job of carpentry, or other mechanic's work, that ought to be on their house, so they tackle the job themselves, which means the buying of tools.

Second, the very fact that today's prices are lower is, in itself, an inducement to buy. This has been demonstrated too often to need any special proof at this time.

Take, for example, the matter of carpenters' tools.

For an advertisement, say six inches deep by two columns wide, you might select a saw, a plane, a chisel, a hammer, a pry bar and a steel square. Six items, you notice. Use illustrations not over a column wide. Three or four lines for each description. About an inch across for the general introduction and your firm name cut at the bottom, and you

BUY NOW AND SAVE

**All High Grade, Guaranteed Goods
BELOW PRE-WAR PRICES**

PERIOLAT

205 W. Randolph Street

One Door West of Wells Street

Durham Duplex Blades, 3 in. package. 35c

Gen Blades, seven in a package. 32c

\$1.00 Universal Painter's Scraper.....50c

50c Universal Putty Knives.....25c

3,600 Assorted Claw Hammers

2,400 Hand Saws, all sizes

3,000 Assorted Guaranteed Planes

4,500 Assorted Screwdrivers

Crescent Gillette Blades, dozen, 64c. Six in pkg. 32c

Ever-Ready Blades, 6 in package. 28c

Combination Squares with center head, 6 inch.....\$1.60

9-in.....\$1.90

12-in.....\$2.15

6-inch Machinists' Scale.....45c

6 1/2-in. Black Swedish Diagonal Cutting Pliers.....85c

5-inch Polished Swedish Diagonal Cutting Pliers.....\$1.65

Big M. Kravater Liveman's Side Cutting Pliers.....\$1.98

10-in. Stillson Pat. Wrenches.....85c

6-inch, guaranteed. 65c

14-inch, guaranteed. \$1.15

24-inch, guaranteed. \$2.85

10-inch Mosberg Monkey Wrench. 50c

4-inch wheel.....\$2.95

Five-inch wheel.....\$3.50

Six-inch wheel.....\$4.95

Jack Plane, 15-inch iron top, adjustable.....\$2.52

Smooth Plane, guaranteed.....\$2.34

Block Plane, 7 1/2 inches long.....\$1.25

6-inch, guaranteed. 75c

18-inch, guaranteed. \$1.75

24-inch, guaranteed. \$2.85

10-inch Mosberg Monkey Wrench. 50c

ZIGZAG RULES

4 foot.....28c

5 foot.....32c

6 foot.....35c

BELL FACE OR PLAIN NAIL

guaranteed Claw Hammers, all sizes, only.....65c

Everlasting Chisel, worth from \$1.00 to \$1.25 each, 3/4, 1 and 1 1/2 inch special, each.....38c

Greenfield Stock and Dies cutting 3/4, 1/2, 3/8 and 1 inch pipe. will take 3/4 to 2 inch pipe.....\$6.95

Chain Pipe Vise, will take 2 1/2 inch pipe.....\$3.25

2 1/2 inch pipe.....\$3.50

MODERN CUT GEARED TOOL GRINDERS

Four-inch wheel.....\$2.95

Five-inch wheel.....\$3.50

Six-inch wheel.....\$4.95

Jack Plane, 15-inch iron top, adjustable.....\$2.52

Smooth Plane, guaranteed.....\$2.34

Block Plane, 7 1/2 inches long.....\$1.25

No. 30 Yankee Automatic Screw Driver.....\$2.28

Automatic Drills, best grade made.....\$1.83

20-inch Bishop Hand Saw.....\$1.48

24 and 26 inch Simonds Hand or Rip Saws, guaranteed, Morrill's Patent Saw Set.....\$2.23

Hand Drills, will take up to 3/4-inch drills.....\$2.10

High Grade Breast Drill, 3 jaw chuck to 7/8 inch.....\$3.60

Harding's High Grade Machinists' Screw Driver.....23c

No. 2 Germantown No. 1 Bench Hatchet.....\$1.35

8,000 Assorted Cold Chisels, case and round nose, small size, each.....15c

Miller Falls 10-inch Ratchet Braces, nickel plated.....\$1.98

Also 50 other styles.

Guaranteed Auger Bits, Irvin pattern, 14-inch, 5-16 inch, 3/4-inch, 7-16 and 9-16 inch, any size, at, each.....38c

9-16, 5-8, 11-16 and 3/4 at.....48c

OPEN THURSDAY AND SATURDAY NIGHTS TILL 9

Typical Newspaper Advertisement of Large City Hardware Dealer.

will have a clean, open advertisement, easy to read and one that will stand out on the newspaper page, just because it is not filled with type.

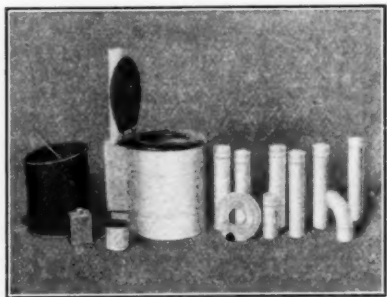
The metropolitan newspaper advertisements of hardware stores that have come under my observation are naturally set more closely because of the high cost of such space, but in the ordinary local newspaper space cost is not so high, so my advice is to use a little larger type for the descriptions than is usual in the city publications.

At the same time you plan your newspaper advertisement, you should also plan a window display to go with it. In fact, the more coordination you have in everything that pertains to your sales promotion the better will be the results. So your interior display schedule should fit in with your advertising and window display.

The two column advertisement shown on the preceding page was published in the *Chicago Daily News* on Friday, May 13th, is a typical example of the big city hardware store advertising and is not reproduced for the purpose of serving as a model, but rather to give you an idea of the prices which "cut price" stores quote. You will note that many of the items quoted are not named by trademark, although in some cases this is done.

Offers Opportunity for Profit.

Hardware dealers in small towns which have no sewerage facilities, as well as dealers who number



Economy Indoor Closet.

Company, Hillsdale, Michigan.

The outer casing and bottom are made of 24 gauge rust-proof galvanized sheet metal. The casing has a roll top edge reinforced with a quarter inch steel rod in the roll around the top. The bottom is securely soldered to a flat turned edge on the casing.

This apparatus is said to be odorless at all times and has a direct system of ventilation which carries all fumes and odors up the ventilating pipe to the outside.

Descriptive literature and terms to dealers may be obtained by writing to the Shiel Manufacturing Company, Hillsdale, Michigan.

Illinois Hardware Men Have District Meeting.

The semi-annual meeting of members of the Central Illinois district of the Illinois Retail Hardware Association was held at the St. Nicholas Hotel in Springfield at 6:30 p. m., September 21st.

Fifty members from Decatur, Jacksonville, Clinton,

farmers among their customers, will find a ready and profitable sale for the Economy Indoor Closet, shown herewith, made by the Shiel Manufacturing Company, successor to Sanitary Chemical Closet

Springfield and a number of other central Illinois cities were present.

State President Hobart Beatty of Clinton, Secretary Leon D. Nish of Elgin, and Field Secretary E. G. Aubrey of Elgin were present and gave brief talks outlining the aims and purposes of the state organization. President Beatty presided at the meeting.

The Reverend Wilbert Dowson delivered the principal address of the evening, on "Business Ethics."

Charles H. Robinson of Springfield, a member of the state executive board, gave a talk, and informal discussions were held on different subjects. Methods of conducting hardware firms were the main topic of the evening.

Keep Your Show Windows in Constant Use.

Money in a safety deposit vault is secure against theft, but it earns no interest.

Potentially, your show windows are money for you.

But they earn nothing unless you keep them in action.

The extent to which your window will sell goods depends on the time and thought you put into it.

You can make your window sell more goods than any clerk you can hire, regardless of the amount of wages.

The most entrancing melody would get on your nerves if played all the time.

Don't let your window exhibit get monotonous.

Organizes Wire Fence Company.

Formation of the Capital Fence Company, Indianapolis, Indiana, recently was effected and the company plans to engage in the manufacture of fencing, gates, wire products and metal troughs.

The company has leased a building formerly occupied by the Liquid Carbonic Company, and machinery is now being installed.

H. E. Harvey, formerly with the International Harvester Company, is president of the new organization. Other officers are secretary-treasurer, R. R. Scott and vice president, H. A. Scott.

New List Prices Are Out for Clark Jewel Oil Stoves.

George M. Clark & Company Division American Stove Company, Chicago, Illinois, has issued new list prices for "Clark Jewel" oil and gasolene stoves to be pasted on page 38 of the Company's No. 112 catalog.

The new list prices represent reductions to the dealer which will aid him in getting more business during the fall and winter seasons.

Iowa Changes the Dates of Its Hardware Convention.

Declaring that the dates already selected, February 7, 8, 9 and 10, 1922, have been found unsuitable, A. R. Sale, secretary Iowa Retail Hardware Association, announces that his organization will hold its twenty-

fourth annual convention February 21, 22, 23, and 24, 1922.

The sessions are to take place in Des Moines, Iowa, and an exhibition of hardware is to be conducted during the convention in the Des Moines Coliseum.

Trade Opportunities in Foreign Lands.

The Bureau of Foreign and Domestic Commerce through its Special Agents, Consular Officers and Commercial Attachés, is receiving information of opportunities to sell hardware and kindred lines in several foreign countries. Names and locations will be supplied on request to the Bureau in Washington or its District Offices. Such requests should be made on separate sheets for each opportunity, stating the number as given herewith:

75.—A merchant in Denmark desires to purchase kitchen utensils. Samples are requested. References.

76.—A grocery dealer in Mexico desires to extend his business and deal in a line of shelf hardware. Catalogues and price lists are requested from large hardware exporters. Quotations should be given f. o. b. El Paso, Texas. Cash to be paid. Reference.

87.—A firm of importers in India desires to form connections with firms for the importation of all classes of hardware. References.

92.—An importing company in India desires to secure an agency and purchase bicycles and their accessories. Quotations should be given c. i. f. Cochin, Alleppey, or Tuticorin. References.

Coming Conventions.

American Hardware Manufacturers' Association, Marlborough-Blenheim Hotel, Atlantic City, New Jersey, October 17, 18 and 19, 1921. Fred D. Mitchell, Secretary-Treasurer, 4106 Woolworth Building, New York City.

National Hardware Association and auxiliary associations, Marlborough-Blenheim Hotel, Atlantic City, New Jersey, October 17, 18, 19, 20, 21, and 22, 1921. T. James Fernley, Secretary-Treasurer, 505 Arch Street, Philadelphia, Pennsylvania.

The Western Retail Implement, Vehicle and Hardware Association, Kansas City, Missouri, January 17, 18, 19, 1922. Exhibition at Convention Hall in charge of Louis W. Shouse. Headquarters, Coates House. Sessions in Century Theatre. H. J. Hodge, Secretary, Abilene, Kansas.

Pacific Northwest Hardware and Implement Association Convention, Davenport Hotel, Spokane, Washington, January 17, 18, 19, 20, 1922. E. E. Lucas, Secretary, Hutton Building, Spokane, Washington.

Oregon Retail Hardware and Implement Dealers' Association Convention, Imperial Hotel, Portland, January 24, 25, 26, 27, 1922. E. E. Lucas, Secretary, Hutton Building, Spokane, Washington.

Kentucky Hardware and Implement Association, Jefferson County Armory, Louisville, Kentucky, January 24, 25, 26, and 27, 1922. J. M. Stone, Secretary-Treasurer, Sturgis, Kentucky.

Indiana Retail Hardware Association, Convention and Exhibition, Athenaeum Hall, Indianapolis, January 24, 25, 26, 27, 1922. G. F. Sheely, Secretary, Argos.

West Virginia Hardware Association Convention and Exhibition, Wheeling, January 31, February 1, 2, 1922. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Iowa Retail Hardware Association Convention and Exhibition, Coliseum, Des Moines, Iowa, February 21, 22, 23, and 24, 1922. A. R. Sale, Secretary-Treasurer, Mason City, Iowa.

Nebraska Retail Hardware Association Convention, Lincoln, January 31 and February 1, 2, and 3, 1922. George H. Dietz, Secretary, 414-417 Little Building, Lincoln, Nebraska.

Michigan Retail Hardware Association Convention and Exhibition, Grand Rapids, Michigan, February 7, 8, 9 and 10, 1922. Karl S. Judson, Exhibit Manager, 248 Morris Avenue, Grand Rapids, Michigan. A. J. Scott, Secretary, Marine City, Michigan.

Oklahoma Hardware and Implement Association Convention and Exhibition, City Auditorium, Oklahoma City, Oklahoma, February 7, 8, 9, and 10, 1922. W. B. Porch, Secretary-treasurer, Oklahoma City.

Wisconsin Retail Hardware Association Convention and Exhibition, Milwaukee, February 8, 9, 10, 1922. P. J. Jacobs, Secretary, Stevens Point, Wisconsin.

Pennsylvania and Atlantic Seaboard Hardware Association, Inc., Convention and Exhibition, Philadelphia Commercial

Museum, Philadelphia, February 13, 14, 15, 16, 17, 1922. Sharon E. Jones, Secretary, 1314 Fulton Building, Pittsburgh.

Illinois Retail Hardware Association Convention, Hotel Sherman, Chicago, February 14, 15, 16, 1922. Leon D. Nish, Secretary, Elgin, Illinois.

Minnesota Retail Hardware Association Convention, St. Paul, February 14, 15, 16, 17, 1922. H. O. Roberts, Secretary, 1030 Metropolitan Life Building, Minneapolis, Minnesota.

Ohio, Hardware Association Convention and Exhibition, Columbus, February 14, 15, 16, 17, 1922. Headquarters, Deshler Hotel. Exhibition, Memorial Hall. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Missouri Retail Hardware Association Convention and Exhibition, St. Louis, Planters Hotel, February 21, 22, 23, 1922. F. X. Becherer, Secretary, 5106 North Broadway, St. Louis, Missouri.

New England Hardware Dealers' Association Convention and Exhibition, Paul Revere Hall, Mechanics' Building, Boston, Massachusetts, February 21, 22, 23, 1922. George A. Fiel, Secretary, 10 High Street, Boston.

Virginia Retail Hardware Association, Roanoke, Virginia, February 21, 22, and 23, 1922. Thomas B. Howell, Secretary, Richmond, Virginia.

South Dakota Retail Hardware Association Convention and Exhibition, Mitchell, South Dakota, February 21, 22, 23 and 24, 1922. H. O. Roberts, Secretary, 1030 Metropolitan Life Building, Minneapolis, Minnesota.

New York State Retail Hardware Association Convention and Exhibition, Rochester, February 21, 22, 23, 24, 1922. Exhibition at Exposition Park. Headquarters and sessions at Powers Hotel. J. B. Foley, Secretary, 412-413 City Bank Building, Syracuse, New York.

Hardware Association of the Carolinas Convention, Winston-Salem, North Carolina, May 17, 18, 19 and 20, 1922. T. W. Dixon, Secretary-Treasurer, Charlotte, North Carolina.

Sheet Metal Contractors' Association of Indiana, Indianapolis, Indiana, May 15, 1922. Ralph R. Reeder, Secretary, 312 East Sixteenth Street, Indianapolis, Indiana.

National Association of Sheet Metal Contractors Convention and Exhibition in the Athenaeum, Indianapolis, Indiana, May 16, 17, 18, and 19, 1922. Edwin L. Seabrook, Secretary, 608 Chestnut Street, Philadelphia, Pennsylvania.

Retail Hardware Doings.

Illinois.

Charles Quandt, 513 Hannah Avenue, Austin, has purchased the hardware store of E. F. Scheldein, 5118 West Chicago Avenue, Austin.

A deal has been closed whereby Arthur Dawson, brother of E. Dawson, bought W. S. Antle's interest in the hardware firm of Dawson and Antle at Petersburg. The firm name will be changed to Dawson and Dawson.

The Nicholas Hardware Company of Oak Park has increased its directors from five to seven.

Indiana.

L. A. Wilkerson of South Bend has purchased the Quality Hardware store at Syracuse.

Iowa.

The proprietors of the Scarville Hardware Company, Scarville, have sold their interests to Gilbert Hanson and H. O. Larson.

The Thomas Hardware store at Colfax, which was bought a few months ago by T. D. Stevenson, has been sold to J. B. Putnam of Des Moines.

Dale Heinzman has purchased an interest in the Hiram Hardware store on Second Street, Ft. Madison, from Hiram Stebbins.

Louisiana.

Berdon-Campbell Furniture Company has purchased the business of the Brown Hardware Company at DeQuincy.

Michigan.

J. Hanville of Grant has sold his hardware business to Blue Brothers.

Minnesota.

Fire totally destroyed the hardware stores of Otto Gerstman of New Ulm and Hopfenspirger and Son of Clements.

August Hoglund has purchased the business property on Benson Avenue, Willmar, west of the Willmar Bakery, from G. A. Erickson, and will open a hardware store as soon as remodeling of the building is completed.

Missouri.

C. Hoke and Sons of Sleeper will open a general hardware store in the J. M. Butts Building on Madison Avenue, Lebanon, October 1st.

Texas.

J. J. Dodson of the Dodson Hardware Company, Alvin, has let the contract for a 40x90 foot brick building adjoining the Drake Building.

Advertising Help and Comment

Send Us Copies of Your Advertisements. Let Us Help You Get Bigger Results by Advice and Suggestions. The Service Is Free. Don't Hesitate to Take Advantage of It

In the advertisement of Thos. Conron Hardware Co., which appeared in the *Danville Press*, Danville, Illinois, aluminum ware is offered at pre-war prices; and the prices are not left to be guessed by the reader, but are definitely stated in the text.

Enamelware and paints are also included in the advertisement, and

THOS. CONRON HARDWARE CO.
"SELLERS OF GOOD GOODS"

August Sale!

The housewives of Danville are attending this sale in large numbers and saving money on their everyday needs. The opportunity of choosing from such a large assortment of good quality cooking utensils does not come often, therefore every housewife should attend this event before it closes.

ALUMINUM WARE



YOU CAN SEE ALUMINUM WARE AT PRE-WAR PRICES

The cooking utensils of beauty, graceful shapes and silver shining surfaces that make your kitchen brighter. And more than good looks there is a genuine satisfaction in using them. Prices on all Aluminum reduced. 6 quart preserving kettle \$2.99; 1 1/2 qt. lipped sauce pan \$1.99; 3 qt. Covered Kettle \$1.99; 2 qt. Covered Sauce Pan \$1.99; 4 qt. Wicker Kettle \$2.99.

Prices Reduced on Granite Ware

Whether you are a bride, starting housekeeping or refurnishing, you are the right kitchen utensils. Royal granite ware is made with real granite and that gives it the very hard, impervious surface that means easy to clean and long lasting. 14 qt. dish pan \$1.99; 12 qt. enamel pot \$1.99; 14 qt. dish pan \$1.99; 2 qt. price holder \$1.99; 4 qt. enamel kettle \$2.99.

Real Values In Vollrath Enamel Ware



Vollrath, the high grade enamel ware is to be sold at a reduction during the month. 4 qt. pudding pot \$1.99; 6 qt. enamel bowl \$1.99; 10 qt. enamel pan \$1.99; 4 qt. preserving kettle \$1.99; 2 qt. coffee pot \$1.99; 2 qt. tea pot (enamel) \$1.99; 2 qt. tea kettle \$1.99; 12 qt. enamel dish pan \$1.99; 10 qt. (enamel) water pot \$1.99.



PAINT

Reduced In Price to

\$3.50 Per Gallon

Buy Paint by Years and Square Yards
Not by Gallons

This is an Unusual Offer. Buy Now.

their prices likewise distinctly quoted.

The original of this advertisement took up a space of 16 by 6 inches.

Therefore, the various items were easy to read.

Artistically, as well as from the angle of resultful wording, this advertisement is deserving of a place in the files of progressive hardware

dealers who are on the alert for suggestions to help in the preparation of their own advertisements.

* * *

Most of the people of today retain pleasant memories of pre-war prices when they compare them with figures that have prevailed during the war and since the Armistice.

Therefore, there is much to attract the attention in the statement made in the advertisement of A. J. Holmes, hardware, which appeared in the *Republican*, Belvidere, Illinois.

"Cooking Utensils at pre-war Prices" means very big reduction and certainly ought to be instrumental in bringing many new cus-

MIRRO Aluminum

Cooking Utensils at pre-war Prices

Our entire stock of heavy gauge aluminum has been re-marked, so that present price should not stop anyone from buying what aluminum they need. Come in and let us show you.

A. J. Holmes,

HARDWARE

PHONE 214. 406 S. STATE ST.

tomers to the hardware store of A. J. Holmes.

In so small a space as that taken up by this advertisement there is not much opportunity to give specific mention of the prices of the particular articles.

In this case, therefore, no adverse criticism can be made as to the failure to quote prices.

* * *

It is gratifying from the point of view of effective merchandising to find such good taste and sound judgment in the construction of an advertisement as that of Hayter and Holbert Hardware, reprinted herewith from the *Republican*, Newton, Kansas.

The copy is devoted to a single group of commodities, "Friday Specials."

There is ample white space for emphasis and the articles are priced in unmistakable figures.

No lengthy description is necessary for this class of goods, so that it suffices merely to name the articles and state the prices.

Friday Specials

Extra Good Galvanized Wash Tubs

No. 1 69c No. 2 79c
No. 3 89c

Manitowish Wash Boards 35c
Hercules Bram Wash Boards 70c
Glass Wash Boards (extra good) 90c

Hayter & Holbert Hdw.

Phone 121

This is a well laid out advertisement, free from complications of type and needless accentuation.

* * *

The advertisement of John Fowler which is reproduced herewith from the *Republican*, Chardon, Ohio, was twice this size in the original.

There was, therefore, plenty of room in which to state prices.

The advertisement gives a list of seasonable articles and uses in bold type the words: "Prices Right."

Seasonable Articles

AT

Fowler's Hardware

Oak Kegs, 5, 10 and 30 gallons
Jugs, 1, 2 and 4 gal.
Crocks, 1 qt. to 30 gal.
Mason Jars, Extra Covers,
Rubbers, Can Wrenches, Etc.

PRICES RIGHT

JOHN FOWLER

HARDWARE, BARNES, PAINTS AND OILS
ROOFING, FARM MACHINERY, ETC.
Phone 121 CHARDON, OHIO

In one understanding of the term all prices are right—for some one or other.

This is too vague to have much appealing power.

It would be better merchandising to give quotations or range of prices on the different articles mentioned.

Warm Air Heating and Ventilating

*Better Installations. How to Sell More Warm Air Heaters.
Reports of Progress in Warm Air Heater Research Work.
Ventilating Factories, Garages, Theaters, and Houses.*

TELLS HOW TO LESSEN CHIMNEY LOSSES THROUGH SMOKE.

The principles involved in the wastes of heat through improper combustion are the same, whether applied to a huge power plant or a small warm air heater.

Consequently, there is valuable instruction in the subjoined paper by F. F. Uehling, a combustion engineer of New York City, presented at the sixth National Exposition of Chemical Industries, New York.

Regardless of whether the fuel consumed in manufacturing operations is solid, powdered, liquid or gaseous, the biggest loss is due to the heat energy wasted up the chimney.

In the average boiler plant, 35 per cent of the heat in the coal burned under the boilers is lost with the stack gases, according to a statement by the Bureau of Mines.

However the waste in the average plant more frequently is not less than 40 per cent and in many cases approaches 50 per cent of the total heat energy in the fuel used.

The causes of this may be attributed to the excess air in the products of combustion, temperature, and amount of unconsumed fuel.

Excess air in the products of combustion results in a decreased fuel efficiency greater than that from any other source.

Coal requires for every pound of carbon 12 pounds of air to consume it.

All air used above this amount is excess and places an unnecessary burden on the temperature possibilities of the furnace.

The amount of fuel consumed increases in proportion.

In good practice, about 25 tons of air is used to burn 1 ton of coal, and in the more poorly operated plants, this amount is often doubled.

Under normal conditions, 25 tons of air occupies a space 16,000 times as large as the coal which it consumes.

The fact so much air is consumed in burning coal is not realized by firemen and the relation which this bears to fuel economy is generally not given sufficient thought.

Air is available in unlimited quantities, but when used to burn fuel in excess of what is required, it becomes one of the most expensive raw materials.

If three times as much air is used as is necessary it will require three times as much fuel as needed.

This gas as it passes up the chimney contains the major portion of the heat that is unnecessarily wasted.

In the average plant, from one-third to one-half of the heat contained in the fuel is dissipated into the atmosphere.

Black Smoke Not Always Waste.

Unconsumed fuel escaping up the chimney, is usually not serious.

The idea a smoky stack is a sign of waste is not always true, in fact, whether the gases leaving a chimney are smoky or smokeless is no indication as to the efficiency with which the fuel is consumed.

Steam boilers, connected with a stack that does not show the slightest trace of smoke may burn twice as much coal per pound of steam generated as when smoke is in great prominence.

Black smoke is unburned carbon, but the amount of carbon in this light and finely divided form that is necessary to give the products of combustion a black appearance is generally only a small fraction of 1 per cent of the actual fuel burned.

Although it is possible for the loss due to this cause to be serious, it is a fact that the average loss from this source can safely be estimated at less than 2 per cent.

To minimize chimney losses, the proper amount of air must be supplied.

This is true whether or not air is mixed with the fuel before it is ignited.

These facts can be determined by flue gas analyses and temperature measurements.

Stack losses may be determined in this way for the effect of any change in fuel or method of firing.

When carbon, the principal constituent of any fuel, is completely burned the result is carbon dioxide.

Complete combustion occurs when air is supplied in excess of what is needed.

If the air supply is reduced too much there is also a possibility of incomplete combustion.

When this is the case some of the carbon in the fuel will burn to carbon monoxide instead of to carbon dioxide.

The large loss in practice is due to excess air and not to an insufficient supply.

Carbon is the principal constituent of all fuels, if 1 pound of carbon were consumed with the exact amount of air required completely to burn it, the 21 per cent of oxygen in the air used would combine with it and appear as 21 per cent carbon dioxide in the products of combustion for the reason that oxygen combines with carbon to form an equal volume of carbon dioxide.

But if the same weight of carbon were consumed with twice the amount of air theoretically required to burn it, only one-half of the 21 per cent of oxygen in the air used would combine with the carbon, the volume of the products of combustion would be twice as much, and the carbon dioxide content only 10.5 per cent.

Again, if the same weight of carbon were consumed with three times the theoretically required air, only one-

third of the 21 per cent of oxygen in that air would combine with the carbon, the volume of the products of combustion would then be three times as great as theoretically necessary and the carbon monoxide content only 7 per cent.

It, therefore, follows that the lower the percentage of carbon dioxide in the products of combustion the greater will be the volume or weight of the flue gases per pound of fuel burned, and the greater the temperature of this gas as it leaves its zone of usefulness the greater will be the loss per unit of its weight.

In average steam boiler practice, every pound of flue gas as it passes up the chimney is laden with sensible heat energy to the extent of from 100 to 200 heat units, and there are from 25 to 30 tons of flue gas for every ton of fuel consumed.

The percentage of carbon dioxide in the products of combustion is an index to the amount of air used per pound of fuel burned.

Chimney losses can thus be controlled by the regulation of the air supplied, so the weight of the products of combustion per pound of fuel burned will be reduced to a minimum.

The two most important constituents of the products of combustion, for determination by flue gas analyses are the percentage of carbon dioxide and the percentage of carbon monoxide.

The former should be made continuously by means of a recorder, while the latter determination is only necessary when the percentage of carbon dioxide is so high that an insufficient supply of air to all or part of the fuel is suspected.

The three factors of chimney losses can be determined with an ordinary flue gas thermometer inserted in the last pass of the boiler furnace, just before the gas enters the stack.

The percentage of carbon dioxide is something the fireman can regulate.

If the brick setting of a furnace or of a boiler is made tight to prevent air infiltration the excess air supply may be decreased to 50 per cent or less by regulation of draft, thickness of firebed, etc., even though the excess air supply may have been 200 or 300 per cent before the attempt to regulate combustion.

Percentage determinations of carbon monoxide need be made only when incomplete combustion exists.

In fact, the majority of plants get remarkably good results, without making carbon monoxide determinations. In many plants, the practice of merely instructing the firemen to keep the percentage of carbon dioxide high has led to good results.

The temperature of the products of combustion as they enter the stack, is one over which the fireman has no control.

This temperature should be kept low but it depends entirely upon how much of the heat in the furnace is utilized before the products of combustion make their final exit.

In boiler practice, stack temperature depends upon the area of the heating surface over which the hot gases pass and the cleanliness of the heating surfaces.

The lower the stack temperature, the less heat will be wasted and the less will be the column of flue gas to carry away heat energy.

Since the temperature of the products of combustion does not vary during short intervals of time, the percentage of carbon dioxide by itself becomes a reliable index to the loss of sensible heat energy.

New Lamneck House Organ Preaches Preparedness.

Bearing the clever title "Fitting Remarks," the new house organ of the W. E. Lamneck Company, Columbus, Ohio, starts out with a preamble by W. E. Lamneck in which he preaches preparedness to all of the firm's customers.

Great and just emphasis is placed upon prompt shipments and intelligent and friendly service.

A problem for tinnerns with complete working instructions for laying out a conical flange to fit around a pipe and against a roof of one inclination is a feature of the first number of this little magazine.

Attention is specially directed to an article entitled "For the Passerby" in which stress is placed upon the advantages of window display of furnace, pipe and elbows to quicken sales.

"Make windows pay their way," says this article. "There are as many schemes of decorating as there are combinations with a deck of cards. A little ingenuity in a window will put your shop on the map."

The discount sheet applying to the W. E. Lamneck Company's catalog, numbers 2 and 3, effective September 15, 1921, is printed on the inside back cover of the new house organ.

"Fitting Remarks" is pleasant reading—free from solemnity and dryness. It is just the sort of stimulant that helps the dealer and contractor revive enthusiasm.

Cultivate Good Business Habits.

Which shoe do you lace first in the morning?

We are the creatures of habit; it is hard to make any change in our accustomed routine.

Try to shift the lacing to the other foot, and see how awkward it appears.

What our environment repeats over and over becomes rooted in our consciousness.

Every day some impressions—some habits—become indelibly marked in our minds, to be, perhaps, translated into conduct.

For this reason we must be tolerant of the habits of others, if the habits are not inimical to social or economic life.

The Chinese saw wood upward, scratch the heel when perplexed, pay a doctor only while they are well, and have night watchmen ring a bell on their rounds.

Some of our habits doubtless are bewildering to the Chinese.

The great task is to keep bad habits from striking root. They propagate like thistles, and there must be constant weeding to keep the character wholesome.

Good habits are as easy to cultivate as are bad ones. They carry their own reward.

Personally we are strong for woman's rights, still we would hate to see the time when every soldier was expected to knit his own socks.—Galveston News.

Practical Helps for Tinsmiths

No Two Jobs Are Exactly Alike. Therefore, the Sheet Metal Worker Has to Meet Each Difficulty as It Comes. Send Your Problems to Us. Let Our Experts Help You.

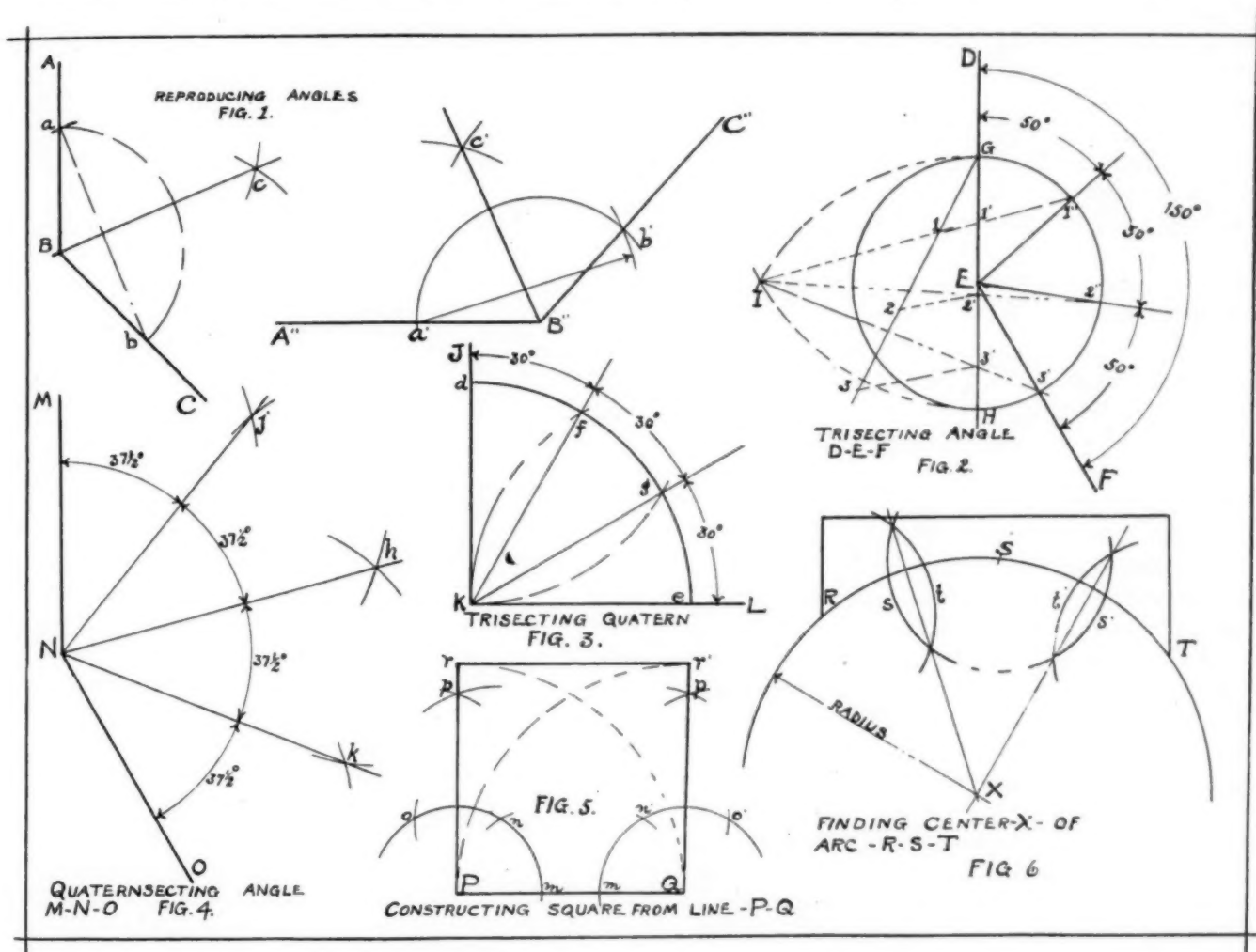
BISECTING AND TRISECTING ANGLES, ETC.

By O. W. Kothe, Principal St. Louis Technical Institute, St. Louis, Missouri. Written especially for American Artisan and Hardware Record.

The sheet metal layer out finds the need of bisecting angles and the transferring of angles, also the reproducing of angles, of very necessity in his working drawings. It is only the untrained workman or the workman with a partial understanding in geometrical

or elbows, tees, or any other purpose. By drawing an arc as a-b from the center B, to any convenient radius, and by using the new points a-b as centers, and a little larger radius, we strike and cross arcs as at c. This enables us to draw the miter line B-C which will be the line that exactly splits the 2 angles, placing an equal portion on each side.

Now to reproduce this angle from say a shingle, or loose piece of paper to our working drawing, let us say to a horizontal position from A" to B". With



Showing Methods of Bisecting and Trisecting Angles.

design and construction who shirks at the knowledge of these constructions. It is because of this attitude toward the fundamentals of pattern drafting, that such men never do attain any pronounced knowledge on the larger and greater things of the trade. The old adage is called back where they have been tested in lesser things and possibly refuse to be tested and therefore no one wishes to take the chance in giving them greater things to do.

So in Figure 1 we have reproducing angles where A-B-C is the given angle. This angle would be taken direct from the building, either for gutters or cornices

dividers pick the radius B-a from the first drawing and using D" as center describe the arc a'-b'. Then pick the diagonal line a-b from the first drawing and using a' as center, cross arcs in point b'. This will give the intersection for drawing the other side line B"-C" and will exactly reproduce the last angle. After this the miter line may be bisected the same as in the first drawing. This treatment may be applied to any sort of angle, no matter what the degree, whether obtuse or acute angles.

We have often heard about trisecting an angle. Let D-E-F be the angle which is to be trisected, and that

means we are to draw miter lines through to point 2 so we have 3 equal divisions. From the center E, describe a circle to any radius. Re-set dividers to the diameter G-H as radius, and from each center strike and cross arcs as in point I. Then from G draw any line as G-3 and on this line, step off 3 equal spaces to any distance or radius desired. Now from where the circle crosses the angle E-F as in 3', draw a line I. Where this line crosses the diameter line G-H in point 3', draw a line to point 3. After this draw lines 2-2'; 1-1' parallel to 3-3'. Now from 1 as center, radiate lines through points 2'-1' until they intersect the circle in points 1"-2"-3" as shown. Now draw the miter lines as E-1" and E-2" which exactly trisect the angle D-E-F as we can see from the degree measurements set on the angles. This principle can be followed on any angle met with.

In figure 3 we have another manner of trisecting a quatern. To trisect this angle J-K-L, we set dividers to any radius, and using K as center, describe the quarter circle d-e. Now retaining the same radius and changing centers to e and d respectively, we strike and cross arcs as in points f and g. By drawing lines K-f and K-g, we trisect our angle J-K-L. This method requires very close working, because the thickness of a line will throw the lines off considerable. Observe this works on the principle of using 6 spaces to make the hexagon of a circle, although in this case we only use a quarter of a circle, making 3 spaces and that forms a trisection.

At Figure 4, we show the matter of quatern secting an angle. Let M-N-O be given angle. From N strike any arc and mark any point as equal from the vertex as M and O. Using these 2 points as centers, and any radius, and using M and h as centers, we strike and cross arcs in point j. We repeat this using h and O as centers and we strike and cross arcs as at k. This enables drawing the miter N-j and K-n, which divides the angle into 4 equal divisions, $37\frac{1}{2}$ degrees in this case.

In Figure 4 we show how to construct a square from a straight line. Let P-Q be the straight line and equal to the length of one side. Then set dividers to any radius, and using P and Q as centers strike arcs as m-o. Use the radius and m as centers, cross arcs as at n and with the same radius using n as center, cross arcs as at o. Repeat this on the other arc as at m'-n'-o'. Now we bisect the arc n-o, setting dividers to any radius, and using these 2 points as centers, we strike and cross arcs as in point p on both sides. After this we use P-Q as radius, which is the length of the side and we strike arcs as P-r' and Q-r. Then by drawing line P-r through point p, and Q-r', we are able to draw the top line r-r' where the side vertical lines intersect the quarter circles. This will make the square and if the working drawing is done perfectly, using intersections, the square should be true.

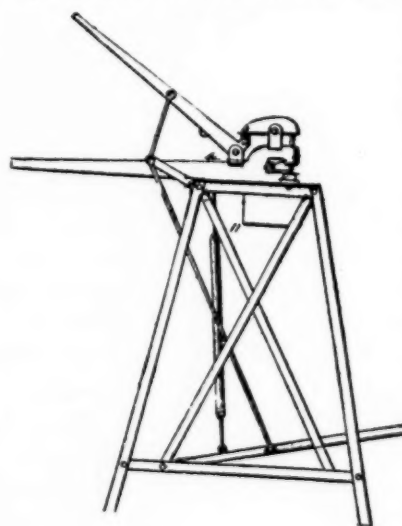
At Figure 6 we show how to locate the center from any arc. Supposing we have a large cylinder or a porch gutter to make, or on a tower. We cut a piece of sheet iron to make the partial sweep of the building line, and on this edge, in the shop, as R-S-T we set any 3 points. Use S as center and any radius, describe an arch indefinitely. Then holding the same radius and

using T and R as centers, we describe arcs crossing the first arc. Where those arcs t-s and t'-s' intersect, draw lines extending them to an apex X. Now this center X is used as center, and X-R as radius, it enables describing the entire circle or as much of it as necessary to do the job.

These geometrical applications are very important in that they lead to dissecting other drawings and considering them by parts or angles and then setting them up again in a workmanlike manner. It is entirely folly for a sheet metal man to think he has an education in pattern drafting when he has not the fundamentals of descriptive geometry. Some teachers flatter the vanity of simple minded mechanics who have never stopped to reason out the exact construction how pattern drafting is built up on descriptive geometry. But nevertheless, the writer would have each of these mechanics and the teachers as well to know that in learning pattern drafting you also learn a great deal of descriptive geometry. But it is the contention of the writer and all other able geometers that to have a sound knowledge of descriptive geometry as a rock bottom foundation, the rest of pattern drafting in its various composition and construction of lines will be clearly understood, be earlier learned and longer remembered.

Acquires Patent for a Punching Machine.

Under number 1,382,674 United States Patent rights have been granted to Vern Rich, Mt. Vernon, South Dakota, for the punching machine shown in the accompanying illustration.



The invention consists of a stand on which is mounted an anvil block having the female die of the punch with the male die pivotally mounted thereon.

The pivoted member which carries the male die is connected with a lever which is arranged to be operated by hand, and suitable connections are made with this lever and a pedal, whereby the machine may be operated by foot power.

Connected to the side of the female die is a slotted arm on which is mounted an adjustable guide, against which the metal is placed to space the holes from the edge of the metal.

An adjustable block having a vertical pin is arranged to slide into different positions in the slotted arm.

The holes, as they are punched in the sheet, are made to register with the pin of the slidable member on the slotted arm, so that the holes will be properly and regularly spaced apart.

By placing a different block on the slotted arm, the machine will be adapted to space holes in a circular line around the edge of a disk.

Greenberg Digs into the Dictionary and Finds Out What Persuasion Means and Tells How to Use It.

To Use Persuasion in Business It Is Necessary to Know All the Facts About the Goods and Service Which You Are Selling.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by J. C. Greenberg, Cleveland, Ohio.

There has been a great deal written and spoken about using the persuasive power in selling goods. Much, yes too much, stress has been laid on the word "persuasion" and too little about what the word itself really means.

What is persuasion? How do we use it, and how do we come by it? That is a vital question. We are told to use it, if so, what really is it? If we know what a thing is, we can better use it. Let us look into this word, and get really well acquainted with it.

Most business men have an idea that "persuasion" means to coax, or to wheedle out of someone that which we want done. This is absolutely wrong. We may coax children, but we cannot coax a business deal.

In the first place, a child has not the understanding born of experience. It has not that state of mind which can analyze the right from the wrong, and is in reality not sensible. But when we talk business, we talk to fully matured minds, capable of judgment and reason. When we talk to a grown person, we appeal to his senses which are in a receptive mood and capable of reaching a decision.

This being the case, let us pick up the dictionary and see what the word "persuasion" means. You will find on looking this word up, that it derived from the word "persuade," which means, "To influence by entreaty or reasoning, win over, convince."

Now if we use this word as an influence to close a deal, we must be able to win over the customer by entreaty or reasoning. It really means to "reason" out with the customer a logical and true mode of action.

In order to do this we must first know our business so we can tell it in a reasonable manner which is convincing. There is only one way to reason, and that way is through truth. In order to know the truth, we must know the facts concerning the article to be sold.

We sheet metal men know too little about the actual facts about the things we have to sell, and can not be persuasive.

If we have not the facts in our brains we can not

tell the "reason" why the customer should buy. We must resort to the next best thing which is price. This is why price has so much to do with our business. We tackle price as a "coaxer" to the customer and lose the profit, because "the lowest price gets the job."

Price is a fallacy. Price has nothing to do with a sale if we can give "reason" why a higher price should be paid. Remember, please, that persuasion is to "influence by reasoning" not by price.

Price means next to nothing. It means that a customer can get a cheaper article for a cheaper price, and the customer already knows this before he comes to your place of business. Therefore, forget the word price, and talk reason. You see, the customer really comes to you to reason the proposition out. If the customer wants to reason with you, and you talk price, you can not connect properly, and a sale is lost.

Talk quality, talk service, talk advantages, talk of the time when the price will be forgotten in the period of service. Talk reason and persuade the customer to see what he wants to buy, and after all it is service. People buy what the article will do, not what it is. If you will study what the article is good for, you will know what it will do, and you have the facts that make reason.

To the customer, "tin" is tin; a furnace is a furnace. But do they really know what these articles will do after they have paid the price?

Salesmanship is really a knowledge of the facts that the customer does not know. You as a salesman must help that customer buy the thing he says he needs. It is up to you to convince him through reason what he really needs, and not what he wants or asks for.

Customers always have a false impression. They get the good and the bad mixed regarding the article, and therefore can not have good judgment in spending their money. In order to have the customer buy the best article for the least money you must show service because service, "or what will the article do" is in reality what the customer has on his mind, but he does not know it.

When a customer asks "how much" he is really asking for the last act before he has seen the first part of the show. Always remember the first act always comes first, and the last act comes last.

Tell the customer, "Mr. ———, you will not appreciate price till you know what service this article will do. You are not buying price, you are buying the comfort you will get out of this article, therefore let us talk about your comfort and happiness first, the price is only a medium through which you get possession of this article. Just listen to me and learn what you need." Then go ahead and tell the good services he will get out of the article.



J. C. Greenberg.

If you follow out along these lines, you will be a good persuader and get more business. If you know all the facts about that article you have to sell, you can tell it easily. It does not take a college professor to tell the truth.

If you merely talk meaningless words, and do not advise the customer rightly so that you help him buy, you are "shooting hot air" and must talk price. Price ruins a customer, because cheap price always bespeaks cheap service.

The Automobile Radiator—What It Is—What It Does—How It Does the Work.

Zideck Explains in Detail the Purpose of the Radiator and Tells How It Performs Its Duties.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by E. E. Zideck, New York City.

THIRD ARTICLE.

The radiator derives its name from what it does; from the service it performs. Its function is to radiate into the air the heat produced by the motor. In other words, the radiator radiates, or imparts, carries, into the air heat produced by the motor working; hence its name radiator.

How It Radiates.

The automobile radiator cools the motor by carrying away from it the surplus heat it produces while working.

There are other kinds of radiators; those, for in-

stances which, while working, produce too much heat for their satisfactory operation, and this excess heat must be carried away if they are to continue working.

The Water Cooling Process.

Over ninety per cent of all automobiles, trucks, tractors, aeroplanes and similar vehicles in use are propelled or, moved, by internal combustion motors and heating-up engines which are cooled by the water circulating method. Motors have water jackets around them with openings on top and bottom through which water passes to and from the radiator.

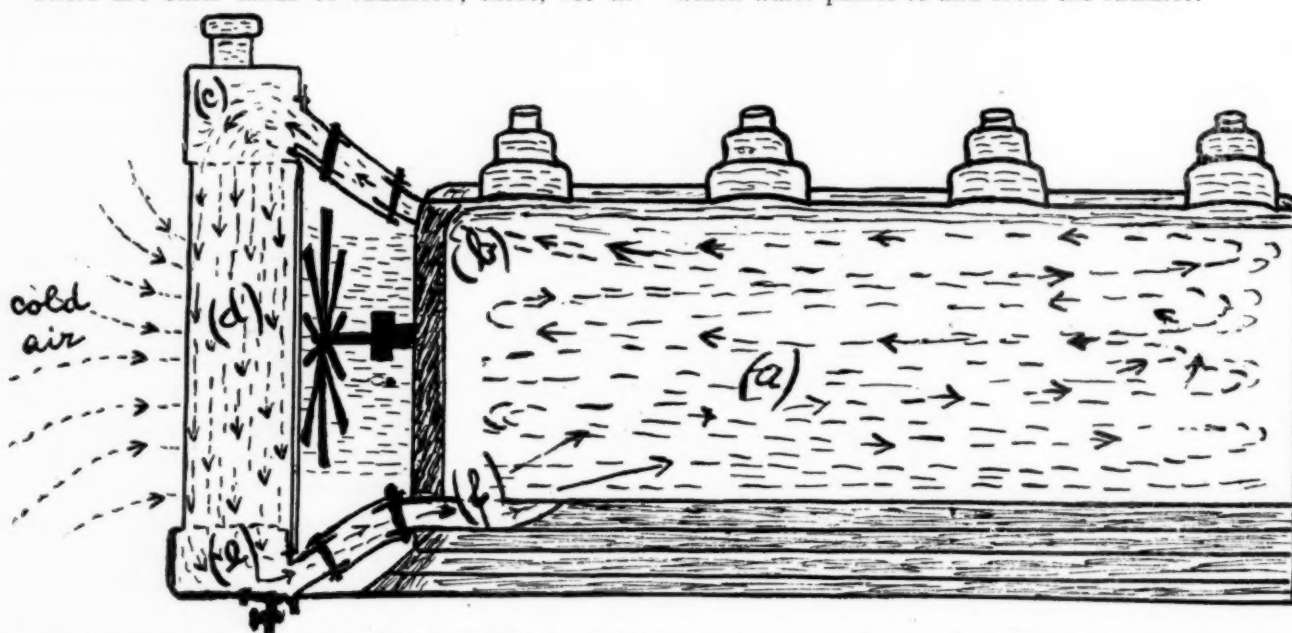


Illustration Showing Hot Water Rising to Surface in Motor Jackets and Flowing Into Radiator, Through Cores, Where It Is Cooled and Then Returned to Motor Jackets.

stance, which are employed in buildings to heat the rooms. Both kinds, however, radiate heat into the air. The kind we are concerned with radiates heat into the air, because it is not wanted in the motor which produces it. Hence, it lessens the heat quantity in the motor and keeps it in the right temperature for operation. The other kind of radiators, on the other hand, carry heat into the air contained in the rooms to make them warm.

The Radiator's Utility.

The radiator with which we are concerned, then, is employed in connection with internal combustion motors furnishing motive power to automobiles, trucks, tractors, aeroplanes, and all other vehicles and contriv-

The Water Circulating Radiator.

Water, made to circulate between radiator and motor, enters the motor jackets cold or nearly so. It absorbs the heat of the motor. Heated, it flows back into the radiator. The radiator absorbs the heat from the water and radiates it into the air. Cooled water flows back into the motor jackets, heats up, passes into radiator, cools, again enters the jackets and the radiator, and so indefinitely as long as the motor is working and is hotter than the water in the radiator.

Heat Reduction.

The internal combustion motor, while working, produces an immense heat; therefore it is being constantly enveloped by cooled water; and the more the motor

heats, the more rapidly must the water be cooled.

The radiator does the cooling. And in order that it may cool rapidly, it is made of the most conductive material and in a way to permit heat conductivity.

The Thermo-Syphon.

By natural law, hot water rises to the top and cold water falls to the bottom. This is called thermo-syphon. The radiator works because of this law. The heated-up water rises to the top in the jackets and towards the inlet of the radiator. Within the radiator it cools itself and falls to the bottom, whence it flows back into the motor jackets.

The more the motor heats, the stronger the force of the hot water rising and flowing into the radiator. And while hot water rises within the jackets, a vacuum is created within them which, just as rapidly as created, is filled with cold water from the radiator. Thus water chases itself within its confines of jackets, hose connections, and radiator, and a rapid circulation ensues. In some cases a pump is employed in the motor to force the circulation of water within these confines.

The Proper Function of the Radiator.

The sole purpose of the radiator is to take out of the water passing through it the heat which it absorbs while passing through the motor jackets. Its proper function is to take out just as much heat as the motor produces in excess of its own requirements.

The above illustration visualizes the process: (a) shows the motor jackets filled with water; (b) shows the hot water rising to the top and into the radiator; (c) is the upper tank of the radiator which receives the hot water coming from the motor; (d) shows the hot water flowing through the radiator core where it is being cooled; (e) shows the lower tank which receives the cooled water; and (f) shows cooled water entering the bottom of the water jacket of the motor.

(To Be Continued)

Metals Are the Basis of Our Civilization.

By the very nature of their craft, sheet metal contractors have more solid reasons for optimism than any other class of business men and, by the same token, more opportunities for trade development.

At a time like this when the metal markets are in a state of acute depression it may be well to remind the pessimists that some people are talking and acting as if the world were about to return to the stone age and dispense with the use of metals, says the Mining and Scientific Press.

They remind us of a child that, standing on the beach, imagines that the ocean is about to dry up because the tide is on the ebb. The sand is bared, the rocks are exposed, the pools are emptied, it looks as if the springs of the everlasting deep had failed.

To a grown man the periodic rise and fall of the waters is a familiar phenomenon; even if he be but vaguely informed concerning the attraction of the moon and sun, he knows, from past observation and experience, that as surely as the waters recede so surely they will return.

He is not frightened, as the child is; he counts confidently on the incoming tide at its appointed season.

Some of our friends are child-like in their mental attitude toward the present depression. They say that "the bottom has been knocked out of mining" and they fail to see anything but gloom, as if a thick fog had fallen upon the sea, so that the turn of the tide was not even surmised.

Any man of adult age, provided his memory be not atrophied and his powers of observation paralyzed, will know, from past experience, that there is "a tide in the affairs of men," and that a period of excessive prosperity is followed by a period of excessive depression, as surely as there is a balance in Nature.

During the war the mining industry of this country benefited enormously from the abnormal demand for the metals consequent upon the needs of warfare on a colossal scale; unfortunately the great increase of production that accompanied the abnormal demand was allowed to continue even after everybody knew that the war was at an end and that the excessive consumption must cease shortly.

For example, the closing of the copper mines and the curtailment of the zinc output were belated; these steps to restore the balance of supply and demand should have been taken immediately after the armistice. They were postponed for more than two years, so that an enormous surplus of metals was accumulated.

The leaders of the industry ignored the fact that the disorganization in Europe and the failure of the United States to make peace with the Central powers precluded the disposal of our metallic output to many European customers, including some of those with whom we had done a great deal of business before 1914.

Now, however, production has been severely curtailed, a legal end has been put to our state of war, our customers in Europe are beginning to organize themselves for new business, and the great surplus of metals in this country is diminishing.

Some months of comparative inactivity are still ahead of us, because those in control of our big mining enterprises deem it wise to deplete stocks until a vigorous demand comes from the consumers.

It will come. "Man does not live by bread alone," he needs metals also. Civilized man requires food first, then clothes, and when these primary necessities have been satisfied he calls for metals.

Our material civilization has a metallic foundation. Unless the whole world returns to political and industrial chaos, it will renew its insistent demand for the miner's products.

The smaller the quantity of metals that is used now, the larger the quantity that will be needed shortly.

Get into the Way of Thinking.

Thinking is a good habit—well worth cultivating.

To study your conduct, your work, your surroundings, your relations to all the rest of the world, is to enrich mind and experience, and supply a perpetual fund of valuable knowledge to draw upon at will.

Listen to Seneca: "As the soil, however rich it may be, cannot be productive without culture, so the mind without cultivation can never produce good fruit."

Do You Know of Any Other Sheet Locks That Are in Use on Sheet Metal Work?

Trade Development Committee of the National Association of Sheet Metal Contractors Wants to Know if There Are Others Than Those Shown Herewith.

The accompanying illustration shows 28 standard locks for sheet metal work. It is reproduced from a tracing about 20x30 inches, done by Otto E. Cluss, the well known St. Louis sheet metal man who has been engaged by the Trade Development Committee of the National Association of Sheet Metal Contractors to prepare the illustrations for the Sheet Metal Data Book which is now in course of completion.

The Committee requests that any sheet metal contractor who knows of any other locks that may be in use forward a sketch of same to 222 John Marshall Place, Washington, D. C., the office of the Committee Chairman, Mr. Paul F. Brandstedt.

It is worthy of note in this connection that arrangements have been made by the Committee that as any section of the work is completed, full sized blueprints of the drawings for that section may be secured from the Committee at nominal cost.

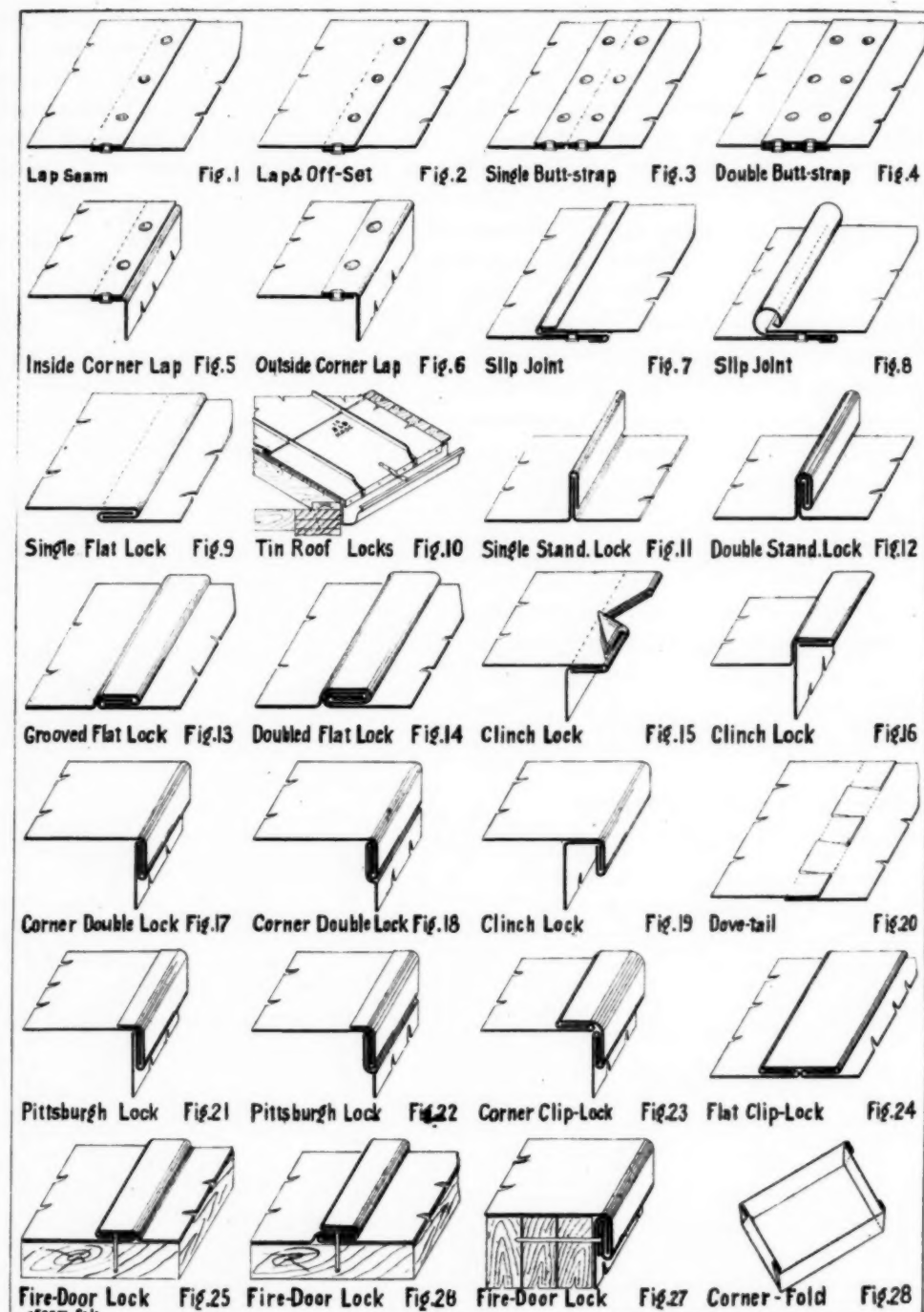
The work of the Trade Development Committee is going ahead in fine shape. All the preliminary details, such as the size of the Data Book page, the nature and class of the illustrations, the approximate number of pages, etc., have been decided.

Mr. Cluss, who as mentioned in the foregoing, has charge of preparing the illustrations, is progressing at a good rate, and judging from the example of his work which appears herewith there will be every reason to expect the very best that can be accomplished.

In the meantime, the locks depicted in this illustration can be studied to advantage by sheet metal workers. There are enough pieces of scrap in the average shop which can be used as material for experimenting

with the various locks shown in the drawing.

It is not unlikely that such experimenting will suggest useful modifications which deserve a place in the forthcoming Trade Development text-book of the Na-



Reproduction of Sample Page Illustration for Sheet Metal Data Book. Showing 28 Standard Locks for Sheet Metal Work. Drawing Made by Otto E. Cluss, Official Draftsman for Trade Development Committee of National Association of Sheet Metal Contractors.

tional Association of Sheet Metal Contractors.

Let us emphasize this again: If you know of any other lock for sheet metal work, send a drawing of it to Paul F. Brandstedt, 222 John Marshall Place, Washington, D. C.

Copper and Brass Association Makes Progress.

The Copper and Brass Research Association, organized this year by the copper, brass and copper alloy interests, is making an energetic effort through its president, R. L. Agassiz, and its representative board of directors, to advance by cooperative efforts the use of copper and brass.

While the organization is less than two months old it numbers among its members every prominent copper company in the United States and South America, as well as practically all the large copper fabricators.

The principal executives of the producers and of the important fabricators who launched the association, are now actively engaged in enlisting the services of production chiefs, engineers, members of research and sales departments and superintendents in a united effort to boost the aims of the association.

The leaders of the association have done a large amount of work to bring the movement to its present stage, and they believe that the time has come when others just as keen for the success of copper, shall have the opportunity to do their share.

G. G. Hussey & Company, Pittsburgh, Pennsylvania, manufacturers of copper sheets, plates and rolls, and a member of the association, have recently issued a comprehensive booklet calling attention to the uses of pure sheet copper for roofing purposes. They say that copper has the most permanency of any metal for that purpose.

Advances New Theory on the Function of a Flux.

A new explanation of the way a soldering flux operates is set forth in an article on soldering fluxes by A. A. Ladon in *Chemical and Metallurgical Engineering*. He writes as follows:

There probably is no operation more commonly used than that of soldering. Almost every manufacturer, shop, garage, power plant, etc., finds everyday use for this process, yet the literature shows an almost absolute lack of information on the subject.

As far as the writer's search revealed, there is no published technical or even semi-technical information.

There are two forms of soldering—hard and soft. Hard-soldering refers to operations requiring a comparatively high temperature, such as brazing and silver-soldering.

Passing mention only will be made of hard-soldering, for the purpose of this article is a consideration of soft-soldering.

In brazing, the commonly used flux is borax, from which the water of crystallization has previously been driven.

A slight amount of ammonium chloride is often added to the powdered dry borax.

The brass used has a high percentage of zinc, so that when it melts on the weld the zinc partly volatilizes, leaving a brass of such composition as to give maximum strength.

Soft-soldering is by far the more commonly used. The most satisfactory solder for general purposes con-

tains equal parts of lead and tin and is known to the trade as "half and half."

The temperature used is that merely high enough to heat the parts to be soldered to the flowing point of the solder.

These considerations are fundamental and are given merely to bring to one's mind the operations which make necessary the use of soldering solutions.

There are many types of soft-soldering fluxes on the market. The old and still commonly used flux is "cut" muriatic acid. Zinc is added to the acid until action ceases. Then the acid is ready for use.

The active material is the zinc chloride formed. However, the action of the acid on the zinc is never complete, there always remaining free acid. This naturally makes corrosion bad unless all of the fluid is carefully washed off the completed work.

To lessen corrosion, commercial zinc chloride salt if often used, and while it is less corrosive than acid, still it excites corrosion markedly.

There are many commercial materials on the market known as soldering salts, the active material of them all being zinc chloride.

For use, the salt is commonly dissolved in water. Alcohol is a better solvent, for it evaporates more quickly, and does not "spatter" so much.

The corrosiveness of zinc chloride made marketable the various "non-corrosive" fluxes on the market. Unfortunately all of the so-called non-corrosive materials are corrosive in a degree and unless carefully washed away excite corrosion.

The non-corrosive—so called—fluxes are made by mixing zinc chloride in a material not an electrolyte—such as vaseline. They can be mixed by stirring or running them through a common "buhr-stone."

A very small amount of water added to the mixture and thoroughly incorporated with it has the effect of stiffening it.

However, this is better accomplished by the addition of paraffine or the use of a higher melting-point vaseline. Ammonium chloride is often added.

Another useful form of soldering flux is in stick form. The chloride is "dissolved" in the paraffine and melted into shape.

Phosphoric acid, lactic acid, tallow, rosin, glycerine, depending on the metals to be soldered, are good. Rosin is the only flux the writer has been able to find that is really non-corrosive.

For ordinary work, it is used dissolved in alcohol. It is slow in action, and the solder does not flow well over the work. Tallow is corrosive on certain metals. Glycerine with slight addition of zinc chloride is very good on German silver.

There are probably a very large number of materials that could be used for fluxes, but zinc chloride—as corrosive as it is—seems to "hold the field."

Each metal requires a different flux to obtain the best results. On flat work a different flux should be used than that used on concave or convex surfaces. Each soldering problem has a particular flux that works the best.

The fact that the same flux does not work to advantage on all types of surfaces of even the same metal leads the writer to believe that the present conception

of the function of a flux is not wholly correct.

The present theory is that the flux dissolves the oxide film so that the molten solder can alloy itself to the metal, but that is disproved by the fact that slowly oxidizing metals like copper or brass scratched and cleaned carefully in an atmosphere of nitrogen can not be well soldered, even in that non-oxidizing atmosphere, without a flux.

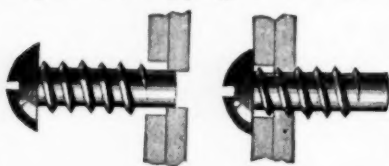
A drop of molten solder placed on a clean metal remains in almost spherical form. The moment a flux is placed on that drop, the solder flattens out.

This indicates that the action of a flux is to decrease the surface tension of the molten metal. This change of surface tension and the solution of the metallic oxides formed are the evident dual purpose of the flux.

There should be a means of decreasing the surface tension of molten metals other than by the use of a corrosive material, and it is the purpose of this article merely to present the possibilities of research on this subject.

Self-Tapping Screw Saves Time and Labor.

A novel design of screw, recently put on the market, requires no tapping of the hole in which it is inserted.



New Self-tapping Screw Made by the Parker Supply Company, New York City.

It has a V-thread of fairly quick pitch, and a cylindrical point or pilot, which steadies the thread while it is seating itself in the metal.

In use, a hole is first drilled in the piece which would ordinarily be tapped, a few thousandths larger than the cylindrical pilot, and the piece to be fastened to it is drilled for clearance over the threads. The pilot is inserted in the hole, and by a few turns with a screwdriver the screw is driven to its seat.

The entire screw is hardened and heat-treated, so that the thread cuts into the metal like a tap.

It is claimed for this screw that it will cut its own thread in die-cast or sand-cast parts of gray iron or softer metals, and that its use in such metals will not injure the thread.

Its special advantage lies in the fact that it eliminates expensive tapping machinery and skilled labor. It is manufactured by the Parker Supply Company, Incorporated, 785 East 135th Street, New York City.

Notes and Queries.

"Gurney" Hot Water Boiler.

From F. W. Lietz, Buckley, Illinois.

Will you kindly advise me who manufactures the "Gurney" hot water boiler?

Ans.—Gurney Heater Manufacturing Company, 188 Franklin Street, Boston, Massachusetts.

Electric Fan for Furnace.

From A. J. Bridges, South Court Street, Bedford, Iowa.

Who makes an electric fan for warm air furnaces?

Ans.—Walworth Run Foundry Company, Cleveland, Ohio, and American Blower Company, 1400 Russell Avenue, Detroit, Michigan.

Electric Fans for Furnaces.

From A. J. Bridges, South Court Street, Bedford, Iowa.

Please advise me where I can secure electric fans for warm air furnaces.

Ans.—Walworth Run Foundry Company, Cleveland, Ohio, and American Blower Company, 1400 Russell Avenue, Detroit, Michigan.

S. Keighley Metal Ceiling and Manufacturing Company.
From W. A. Yaeger, 1628 Broadway, Lorain, Ohio.

Will you kindly advise me where the S. Keighley Metal Ceiling and Manufacturing Company is located?

Ans.—124 Third Avenue, Pittsburgh, Pennsylvania.

Hot Water Heater.

From Patrick Wagner, Box 124, Niagara, Wisconsin.

Where can I secure a device for heating hot water for bath when warm air furnace is not in use?

Ans.—Quick Meal Stove Company, 825 Chouteau Avenue, St. Louis, Missouri; George M. Clark and Company, 179 North Michigan Avenue, Chicago, Illinois; Dangler Stove Company, 5017 Perkins Avenue, Cleveland, Ohio; all divisions of the American Stove Company.

Small Mangles.

From H. A. Lee, Canton, South Dakota.

Please refer me to a firm making small mangles for private or rooming house use.

Ans.—Lovell Manufacturing Company, 62 East Lake Street, Chicago, Illinois; and Erie, Pennsylvania.

Lead-Headed Nails.

From Messenger and Parks Manufacturing Company, Corner First Street and Ogden Avenue, Aurora, Illinois.

Kindly advise us who manufactures lead-headed nails for corrugated sheets.

Ans.—Alexander Filshie, 5801 South State Street, Chicago, Illinois.

Liquid Soap.

From H. A. Lee, Canton, South Dakota.

Where can I buy liquid soap?

Ans.—Theo. B. Robertson Products Company, 700 West Division Street, Chicago, Illinois; B. J. Johnson Soap Company, 42 Fourth Street, Milwaukee, Wisconsin; Bonyata Chemical Company, Grinnell, Iowa.

Repairs for "Huron" Stove.

From Stove Dealers Supply Company, 310 Chestnut Street, Milwaukee, Wisconsin.

Please advise us where we can obtain repairs for the "Huron" stove.

Ans.—Northwestern Stove Repair Company, 622 Roosevelt Road; Central Stove and Furnace Repair Company, 1801 Diversey Parkway; both of Chicago, Illinois.

Small Refrigerating Plants.

From C. V. Brokenicky, Blue Rapids, Kansas.

Will you please give me addresses of some firms manufacturing small refrigerating plants.

Ans.—Iceless Machine Company, 12014 Iowa Avenue, Cleveland, Ohio; Isko Company, 111 West Washington Street; Blazek and Company, 2249 West Lake Street; Frigidaire Corporation, 317 North Michigan Avenue; all of Chicago, Illinois.

Machine for Cutting Ventilators.

From Otto Haack, No. 29 West Works Street, Sheridan, Wyoming.

Can you tell me where I can buy a machine to cut ventilators in automobile hoods?

Ans.—Joseph T. Ryerson and Son, 2558 West 16th Street, Chicago, Illinois.

Illustrations of New Patents

Watch This Page. Keep Yourself Informed Concerning Improved Devices Which May Save Labor in Your Shop or Add Another Source of Income to Your Retail Store.

1,388,156. Fishing-Fly and Method of Making the Same. Chauncy W. Allen, Sacramento, Calif. Filed July 27, 1920.

1,388,191. Hoe. John F. Newman, Kansas City, Mo. Filed June 21, 1920.

1,388,205. Variable Track Hinge. Henry J. Rutz, Lake City, Minn. Filed May 18, 1921.

1,388,229. Latch Mechanism for Garage Doors. Wesley G. Winans, Detroit, Mich., assignor to Frederick Knowlson, Ann Arbor, Mich. Filed June 4, 1920.

1,388,257. Window Fastener. John L. Bush, Little River, Kans. Filed January 19, 1921.

1,388,252. Window Sash Regulator and Operator. Louis J. Gouin, Freeport, Ill. Filed September 22, 1919.

1,388,272. Door Holder. William H. Lawrence, Akron, Ohio. Filed December 24, 1920.

1,388,282. Carpenter's Adjustable Fillister or Rabbit Plane. James E. Meed, Palestine, W. Va. Continuation of application Serial No. 225,151, filed March 28, 1918. This application filed June 21, 1920.

1,388,362. Weeder. Austin E. Miller, Cheney, Washington. Filed August 12, 1919.

1,388,364. Cake Baking Pan. Mary A. Miller, Lancaster, Pa. Filed March 16, 1921.

1,388,386. Bait Holder for Fishhooks. Sven Svenson, La Crosse, Wis. Filed October 27, 1919.

1,333,521. Incinerator Attachment for Gas Stoves. Harry J. Hoover, Norwood, Ohio. Filed November 24, 1917.

1,388,547. Cutting Tool. Joseph E. Burns, Syracuse, N. Y. Filed September 25, 1919.

1,388,557. Snap Hook. Karl F. Gerhard, Hatton, Wash. Filed August 23, 1920.

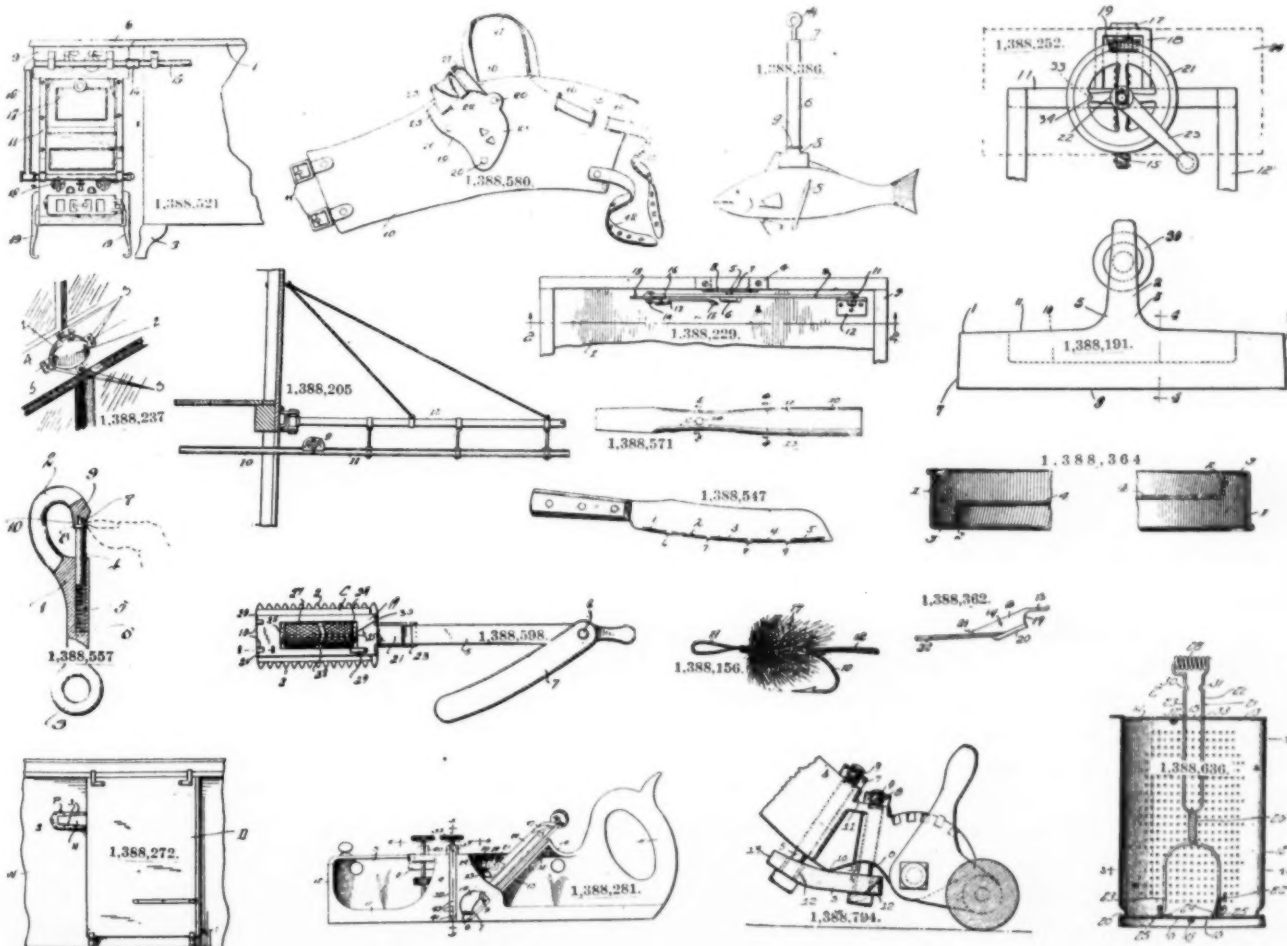
1,338,571. Tool Handle. George T. Johnson, Waco, Texas. Filed March 10, 1921.

1,388,580. Husking Hook. Joseph M. Koziol, Pender, Nebr. Filed April 22, 1921.

1,388,598. Razor. Richard E. Perkins, Boston, Mass. Filed September 4, 1920.

1,388,636. Kitchen Utensil. Edward F. Frautnick, Elgin, Ill. Filed April 16, 1921.

1,388,794. Lawn Mower Attachment. William J. Boll, Platteville, Wis. Filed September 16, 1920.



Weekly Report of the Markets

General Conditions in the Steel Industry. Review of Prices and Tendencies in Sheet Metals, Pig Iron, etc.

STEEL MILL OPERATIONS SHOW IMPROVEMENT.

The upward progress in steel mill operations that has been in evidence since July has been unchecked and the industry as a whole is producing steel at about a third of capacity against 20 per cent during July.

It is estimated that the country's steel production in September will total close to 1,400,000 tons as compared with 1,240,915 tons in August.

This betterment has not extended to the export trade, however, as figures announced during the week showed that iron and steel exports during August amounted to about 73,792 tons as against 86,532 tons in July and 431,848 tons in the corresponding month last year. August exports were the lowest for any month since January, 1909.

Since the middle of July there has been improvement in demand for all descriptions of finished steel.

That is something that could scarcely be avoided since there was hardly any demand at all then.

The improvement has been decidedly greater in sheets, tubular goods, wire products and tin plate than in bars, shapes, plates and rails. Thus as to demand there are two classes.

One could divide the finished steel lines into two classes by another method and get the same division, that is, into the light and heavy.

Sheets, wire products, tubular goods and tin plate could be put in as the lighter class and bars, shapes, plates and rails as the heavier class.

The natural result of this is that the improvement in steel demand in general is greater, weighing it as to its real importance, than is the improvement in steel tonnage, measured by steel ingot production.

It is doubtful whether the production of steel ingots is running at more than about 35 per cent of capacity, and that looks like a low percentage, particularly when there has been the market experience of the past fortnight of both wire products and sheets advancing in price.

The increase in ingot production, however, is large in a relative sense, for at about the middle of July the rate was under 20 per cent, and from that to about 35 per cent is almost a doubling.

Steel.

The recent increased demand for sheets is stiffening the semi-finished steel market and this week the Weirton Steel Company advanced its price on this product from \$30 to \$32.50 and the Brier Hill Steel Company followed suit with an increase to \$32 a ton f. o. b. Pittsburgh.

It is expected that the other makers of this product will make similar announcements in the near future.

The higher price, it is stated, does not represent cost and no long time deliveries will be booked at this

figure. For the past few weeks the demand for steel has been divided into two distinct classes the first of which consists of sheets, pipe, wire products and tin plate for which the demand has been decidedly better with an attendant advance in prices and second bars, shapes, plates and rails the demand for which has been of less volume and with steadily declining prices.

With the lower prices on bars makers of nuts and bolts have been consistently shading the "official" or published quotations and it is expected that public announcement of the lower range, about 10 per cent lower, will be made in a few days.

Copper.

The copper producing industry is now experiencing the most extremely unfavorable conditions it will be called upon to endure as a result of the European war.

For over a year the world's industry has been experiencing that paralysis that normally follows a severe shock.

Although the general expectation is that there will be a recovery, few are optimistic enough to believe it will be rapid when the turn comes.

It would be natural that the producers and distributors of electrical current should be the first American consumers to come into the market.

These companies are raising new capital just now and already some orders have been received for transmission wire.

Sales of about 10,000,000 pounds of copper were made by producers last week to domestic consumers, the American Brass Company being credited with having taken half of this amount.

Sales of 8,000,000 pounds are also understood to have been made for export by the Copper Producers Association.

Including sales made in the outside market on both domestic and foreign account, last week's business was at least 20,000,000 pounds.

Most of the sales are understood to have been made for September and October shipment.

Manufacturers of finished copper and brass deny that there is any increase in the demand for their products thus far nor do they anticipate any radical change in the near future. The fact remains, however, that producers are disposing of more copper from day to day and they are confident that the statistical position will continue to improve.

Tin.

The deliveries into consumption this month will not compare favorably with last month and there is considerable tin to be taken care of against September arrivals and due in October.

So far this month 2,495 tons have arrived at Atlantic ports and there are now afloat from the East

Indies 3,025 tons, there being at least three steamers from the Far East with heavy cargoes.

It is evident that quite a portion of this tin was bought by consumers in anticipation of improvement in trade and will not be needed until later on.

The tendency, therefore, is to sell prompt and nearby tin and buy far off futures, thus contributing to a very irregular spot market.

Solder.

No additional changes are recorded in Chicago prices of solder. The quotations now in effect are as follows: Warranted, 50-50, per hundred pounds, \$18.75; Commercial, 45-55, per hundred pounds, \$17.25; and Plumbers', per hundred pounds, \$16.00.

Lead.

Very little soft Missouri lead is coming East because the freight rates put it at a disadvantage with desilverized, for which the leading producer is quoting 4.70 cents New York and is believed to be receiving most of the Eastern business.

Chicago prices for American pig lead advanced 15 points, that is, from \$4.85 to \$5.00 per hundred pounds and bar lead from \$5.60 to \$5.75 per hundred pounds.

According to the returns of the Department of Commerce 8,112 tons of lead were imported during August, of which 6,485 tons represented the lead contents of ore and bullion and 1,627 tons in the form of pig lead and scrap. For the eight months ending August the total imports were 53,942 tons as compared with 44,474 tons during the corresponding period a year ago.

Zinc.

The domestic zinc market continued the advance inaugurated Monday and the St. Louis settling price was up 5 points to 4.30 cents a pound and Chicago 15 points, making slab zinc \$4.85 per hundred pounds in this market.

Nearly all of the producers are following the policy of selling only against their current output without regard to surplus stocks which were accumulated when the market was on a higher level, and several of them report that they have sold their quota for September and will therefore be out of the market for a few days.

Sheets.

Last week's sheet bookings of the leading interest were the heaviest for any week in the company's entire history. This is certainly a startling showing.

Two weeks earlier the company had the largest bookings since April and a week earlier the largest for any week of this year.

Those records appeared good in their way, but they were not spectacular, as it did not require a great deal to make a better showing than the earlier weeks of this year, since this has not been a good year by any means.

To overtop all past records is, however, quite another thing. The heavy bookings were due, of course, to the prospect that prices would advance.

It may be mentioned that the company's sales representatives did not directly assert that the company was going to advance its prices. Rather, they pointed out

that independents had advanced prices and left it to the customers to draw their own conclusions.

Some of the mills will probably accept contracts, in a limited way, at present prices, while the business booked recently, so far as can be ascertained, was all in the form of actual shipping orders with specifications attached.

If mills felt sure of another advance coming they would feel that the advance would make contracts good at present prices, inducing specifying.

Tin Plate.

Tin plate demand is showing a healthy increase and prices are firming up inasmuch as the \$4.75 price has disappeared and \$5 rules in shaded quotations while \$5.25 is still the "official" mill quotation.

One interest with a surplus variously estimated at from 50,000 to 70,000 boxes has about liquidated this stock.

Buying of tin plate at present is all for prompt shipment, consumers being in no mood to buy for forward delivery.

The consumers feel that there is still room for tin plate to decline, even though there have been extensive declines this year up to date.

It can not be said that consumers have definite ideas as to price, below the present market, but they feel there is more chance of declines than of advances.

There was one year, 1912, in which the season price for the following year was named September 4th, but that was phenomenally early for announcement of a price for a contract period.

This time the settlement will be much later. There is no talk now as to prices for the first half of 1922, which is the next contract period.

Old Metals.

Wholesale quotations in the Chicago district which should be considered as nominal are as follows: Old steel axles, \$12.00 to \$12.50; old iron axles, \$17.00 to \$18.00; steel springs, \$11.00 to \$11.50; No. 1 wrought iron, \$9.00 to \$9.50; No. 1 cast, \$12.00 to \$12.50; all per net tons. Prices for non-ferrous metals are quoted as follows, per pound: Light copper, 6 cents; light brass, 3.50 cents; lead, 2 cents; zinc, 1.50 cents; cast aluminum, 8½ cents.

Pig Iron.

Sales of pig iron in the Eastern district during the past week are estimated at 60,000 tons, the largest volume of business for any week in months.

By far the larger portion of this business came from radiator, stove and boiler makers in New England and was booked by the Eastern Pennsylvania furnaces.

Prices varied but were invariably going higher. One furnace sold 10,000 tons of No. 2 foundry at \$19.75 and 12,000 tons was sold by another maker at from \$19.50 to \$20 but the same interest refuses to sell any more under \$21.

One railroad company has out an inquiry for 700 tons of foundry iron and equipment makers are in the market for small tonnages. A car wheel manufacturer in St. Louis recently purchased 4,000 tons.

Some 5,000 tons of merchant iron for Eastern consumption were placed with a Buffalo furnace.

Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

PIG IRON.

Chicago Foundry	\$22 70
Southern Fdy. No. 2.....	25 67
Lake Sup. Charcoal.....	33 50
Malleable	22 70

FIRST QUALITY BRIGHT TIN PLATES.

	Per Box
IC 14x20 112 sheets	\$11 25
IX 14x20.....	12 25
IXX 14x20.....	13 80
IXXX 14x20.....	15 15
IXXXX 14x20	16 60
IC 20x28.....	22 50
IX 20x28.....	24 50
IXX 20x28.....	27 60
IXXX 20x28.....	30 30
IXXXX 20x28.....	33 20

COKE PLATES

Cokes, 180 lbs....	20x28	\$13 40
Cokes, 200 lbs....	20x28	13 70
Cokes, 214 lbs....	IC 20x28	14 05
Cokes, 270 lbs....	IX 20x28	16 25

BLUE ANNEALED SHEETS.

Base.....	per 100 lbs.	\$3 38
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ONE PASS COLD ROLLED BLACK.

No. 18-20.....	per 100 lbs.	\$3 95
No. 22-24.....	per 100 lbs.	4 00
No. 26.....	per 100 lbs.	4 05
No. 27.....	per 100 lbs.	4 10
No. 28.....	per 100 lbs.	4 15
No. 29.....	per 100 lbs.	4 25

GALVANIZED

No. 16.....	per 100 lbs.	\$4 40
No. 18-20.....	per 100 lbs.	4 55
No. 22-24.....	per 100 lbs.	4 70
No. 26.....	per 100 lbs.	4 85
No. 27.....	per 100 lbs.	5 00
No. 28.....	per 100 lbs.	5 15
No. 30.....	per 100 lbs.	5 65

BAR SOLDER.

Warranted,	
50-50.....	per 100 lbs. \$18 75
Commercial,	
45-55	per 100 lbs. 17 25
Plumber's.....	per 100 lbs. 16 00

ZINC.

In Slabs	\$4 85
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SHEET ZINC.

Cask lots	11c
Less than cask lots....	11 1/4 - 11 1/2 c

COPPER.

Copper Sheet, mill base...	\$0 19 1/4
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LEAD.

American Pig	\$5 00
Bar	5 75
Sheet.	
Full coils.....	per 100 lbs. \$7 75
Cut coils	per 100 lbs. 8 00

TIN.

Pig tin	29 1/4 c
Bar tin	31 1/4 c

HARDWARE, SHEET METAL SUPPLIES, WARM AIR HEATER FITTINGS AND ACCESSORIES.

ADZES.

Coopers'.	
Barton's	Net
White's	Net

ALARM CLOCKS.

Big Ben and Baby Ben....	per doz. \$28 80
America	13 56
Tattoo	28 50

AMMUNITION.

Shells, Loaded, Peters.	
Loaded with Black Powder..	18%
Loaded with Smokeless Powder	18%

Winchester.	
Smokeless Repeater Grade,	10 & 4%
Smokeless Leader Grade,	10 & 4%
Black Powder.....	10 & 4%

U. M. C.

Nitro Club.....	10 & 4%
Arrow	10 & 4%
New Club.....	10 & 4%

Gun Wads—per 1000.

Winchester 7-8 gauge..	10 & 7 1/2 %
" 9-10 gauge..	10 & 7 1/2 %
" 11-28 gauge..	10 & 7 1/2 %

Powder.

DuPont's Sporting, kegs..	\$11 25
" " 1/4 kegs	3 10
DuPont's Canisters, 1-lb..	56
" " kegs..	22 00
" " 1/4 kegs	5 75
" " canisters	1 00
Hercules "E.C." kegs.....	22 50
Hercules "Infallible," 25 can drums	22 00
Hercules "Infallible," 10-can drums	9 00
Hercules "E.C." and "Infallible," canisters.....	1 00
Hercules W. A. 30 Cal. Rifle, canisters	1 25
Hercules Sharpshooter Rifle, canisters	1 25
Hercules Bullseye Revolver, canisters	1 00

ASBESTOS.

Paper up to 1/16.....	10c per lb.
Millboard 3/32 to 1/4.....	10 1/2 c per lb.
Corrugated Paper (250 sq. ft.).....	\$6.50 per 100 lbs.
Rollboard	11c per lb.

AUGERS.

Boring Machine..	40 @ 40 & 10 %
Carpenter's Nut.....	50 %

Hollow.

Bonney's.....	per doz. \$30 00
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Post Hole.

Iwan's Post Hole and Well	alloys	30 and 5%
Vaughan's, 4 to 9 in.,	without handles..	per doz. \$14 00
Ship.		
Ford's		Net

AWLS.

Brad.	
No. 3 Handled..	per doz. \$0 65
No. 1050 Handled "	1 40
Patent asst'd, 1 to 4 "	85

Harness.

Common	per doz. \$1 05
Patent	" 1 00

Peg.

Shouldered	" 1 60
Patented	" 75

Scratch.

No. IS, socket	
Handled	per doz. \$2 50
No. 344 Goodell-Pratt, list less.....	35-40%
No. 7 Stanley.....	per doz. \$2 25

AXES.

First Quality, Single	
Bitted (unhandled), 3 to 4 lb., per doz.....	14 50
Good Quality, Single	
Bitted, same weight, per doz.	13 00

BAGS, PAPER, NAIL.

Pounds ..	10	16	20	25
Per 1000..	\$5 00	6 50	7 50	9 00

BALANCES, SPRING.

Universal.	
Sight Spring.....	List less 25%
Straight	List less 25%

BARS, WRECKING.

V. & B. No. 12.....	\$0 45
V. & B. No. 24.....	0 75
V. & B. No. 324.....	0 80
V. & B. No. 30.....	0 85
V. & B. No. 330.....	0 90

BEATERS.

Carpet.	Per doz.
No. 7 Tinned Spring Wire..	\$1 10
No. 8 Spring Wire Cop- pered	1 50
No. 9 Preston.....	1 75

BELLS.

Call.	
3-inch Nickeled Rotary Bell,	
Bronzed base...per doz.	\$5 50

Cow.

Kentucky	33 1/2 %
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Door.

New Departure Automatic..	Net
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Rotary.

3 -in. Old Copper Bell....	Net
3 -in. Old Copper Bell,	
fancy	Net
3 -in. Nickeled Steel Bell..	Net
3 1/2 -in. Nickeled Steel Bell..	Net

Hand.

Hand Bell, polished.....	
.....List plus 15-10%	
White Metal...List plus 15-10%	
Nickel Plated....List plus 10%	
Swiss	Net

Miscellaneous.

Church and School, steel	
alloys	30%
Farm, lbs..	40 50 75 100
Each	\$3 00 3 75 5 50 7 25

BEVELS, TEE.

Stanley's Rosewood handle, new	
list	Nets
Stanley iron handle.....	Nets

BINDING CLOTH.

Zinc	55%
Brass	40%
Brass, plated	60%

BITS.

Auger.	
Jennings Pattern.....	Net
Ford Car.....	List plus 5%
Ford's Ship.....	" " 5%
Irwin	35%
Russell Jennings.....	Plus 15%
Clark's Expansive.....	33 1/2 %
Steer's " Small list, \$22 00..	5%
" " Large "	\$26 00..5%
Irwin Car.....	35%
Ford's Ship Auger pattern	
Car	List plus 5%
Center	10%

Countersink.

No. 18 Wheeler's..per doz.	\$2 25
No. 20	3 00
American Snailhead	1 75
" Rose ..	2 00
" Flat ..	1 40
Mahew's Flat ..	1 60
" Snail ..	1 90

Dowel.

Russel Jennings.....	plus 20%
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Gimlet.

Standard Double Cut Gross	\$8 40
Nail Metal Single	
Cut	Gross \$4 00—\$5 00

Reamer.

Standard Square.....	Doz. \$2 50
American Octagon...	" 2 50

Screw Driver.

No. 1 Common.....	Each 15c
No. 26 Stanley.....	Each 70c

BLADES, SAW.

Wood.	
Atkins 30-in.	
Nos.	6 40 26
	\$8 90 \$9 45 \$5 40
Disston 30-in.	
Nos.	6 66 26
	\$9 45 \$10 05 \$9 45

BLOCKS.

Wooden	20%
Patent	20%

BOARDS.

Stove.	Per doz.
26x26, wood lined.....	\$14 45
28x28, " "	18 95
30x30 " "	19 00
26x26, paper lined.....	\$ 8 15
28x28, " "	9 10
30x30, " "	10 80

Wash.

No. 760, Banner Globe	
(single)	per doz. \$5 25
No. 652, Banner Globe	
(single)	per doz. 6 75
No. 801, Brass King, per doz.	8 25
No. 860, Single—Plain	
Pump	6 25

BOLTS.

Carriage, Machine, etc.	
Carriage, cut thread, %x6	
and sizes smaller and	
shorter	60%
Carriage sizes larger and	
longer than %x6.....	50-10%
Machine, %x4 and sizes	
smaller and shorter....	60-10%
Machine, sizes larger and	
longer than %x4....	50-10-5%
Stove	70-10%

Mortise, Door.

Gem, iron	5%
Gem, bronze plated.....	5%

Barrel.

Cast	Net
Wrought	"
Wrought, bronzed.....	"

Flush.	
Wrought	Net
Spring.	
Wrought	"
Wrought, heavy.....	"
Square.	
Wrought	"

BOXES.	
Mail. No. 2	4 10
Per doz. \$18 00	\$23 00 \$29 00
Mitre.	
Stanley's.....	Net Prices
Stearns, No. 2. .per doz.	\$48 00

BRACES, RATCHET.	
Goodell-Pratt No. 408.....	\$4 60
" " No. 410.....	4 80
" " No. 412.....	5 00
V. & B. No. 444 8 in.....	4 65
V. & B. No. 333 8 in.....	4 30
V. & B. No. 222 8 in.....	4 00
V. & B. No. 111 8 in.....	3 50
V. & B. No. 11 8 in.....	3 05

BURRS, RIVETING.	
Copper Burrs only...30% above list	
Timbers' Iron Burrs only.....	Net

BUTTS.	
Steel, antique copper or dull brass finish—case lots—	
3 1/2 x 3 1/2...per dozen pairs	\$2 75
4 x 4.....	3 80
Heavy Bevel steel inside sets, case lots—	
.....per dozen sets	7 50
Steel bit keyed front door sets, each.....	1 80
Wrought brass bit keyed front door sets, each...	3 25
Cylinder front door sets, each.....	7 00

CALIPERS.	
Double	Net
Inside and Outside.....	"
Wing	"

CANS.	
Milk.	
Ohio.	
Gals. 5 8 10	
Each \$3 65 \$4 45 \$4 70	
Gem.	
Gals. 5 8 10	
Each \$3 85 \$4 95 \$5 20	
Jersey or Holstein.	
Gals. 5 8 10	
Each \$4 15 \$5 60 \$5 90	

CAN OPENERS.	
See openers.	

CARRIERS.	
Hay.	
Diamond, Regular...each, Nets	
Diamond, Sling.....	" "

CARTRIDGES.	
See Ammunition.	

CASTERS.	
Standard—Ball Bearing,	
.....50 & 10%	
Bed	40%

Common Plate.	
Brass Wheel	15%
Iron and porcelain wheels, new list	50%
Philadelphia Plate, new list	50%
Martin's	40%

CATCHERS, GRASS.	
No. 160S.....per doz.	\$12 25
No. 165S.....	14 01

CEMENT, FURNACE.	
American Seal, 5 lb. cans, net	\$0 45
" " 10 lb. cans, "	90
" " 25 lb. cans, "	1 87
Asbestos, 5 lb. cans.....	45
Pecora, 5 lb. cans.....	45
" 10 lb. cans.....	90
" 25 lb. cans.....	1 87

CHAINS.	
Breast Chains.	
With Slide.....doz. pairs,	\$5 50
Without Slide.....	5 05
Doubleslack	9 35
With Covert Snaps	6 38

Picture Chains.	
Light brass, 3 ft. per doz.	1 25
Heavy brass, 3 ft.	1 75

Sash Chain. (Morton's)	
Steel, per 100 ft.	
0	\$2 50
2	3 10
1	3 60

Champion Metal.	
0R	5 40
2R	5 60
1R	7 75

Champion Metal.—Extra Heavy.	
1H	\$9 50

Cable Sash Chains.	
Steel.....List Net Plus 15%	

CHALK, CARPENTERS'.	
Blue	per gro. \$2 00
Red	2 00
White	1 80
Common White School Crayon	0 30

CHIMNEY TOPS.	
In bags.....per bag	\$1 80

CHECKS, DOOR.	
Corbin	Net list
Russwin	Net list

CHISELS.	
Cold.	
Good quality, 1/4 in., each	\$0 44
" " 1/2 in., "	0 28

Diamond Point.	
V. & B. No. 15, 1/4 in.....	0 23
V. & B. No. 15, 1/2 in.....	0 48

FIRMER BEVELLED.	
Berg's (Swedish).	
1/2-inch.....per doz.,	\$ 4 45
1 - "	7 15
1 1/2 - "	10 15
2 - "	17 15
3 1/2 - "	26 95

Round Nose.	
V. & B. No. 65, 1/4 in.....	0 33
V. & B. No. 65, 1/2 in.....	0 44

SOCKET FIRMER.	
Berg's (Swedish).	
1/2-inch.....per doz.,	\$11 95
1 - "	16 75
1 1/2 - "	23 95
2 - "	35 95

Cape.	
V. & B. No. 50, 1/4 in.....	0 29
V. & B. No. 50, 1/2 in.....	0 64

CHUCKS, DRILL.	
Goodell's, for Goodell's Screw Drivers.....List less 35-40%	
Yankee, for Yankee Screw Drivers.....	
Drivers	\$6 00

CHURNS.	
Anti-Bent Wood.	
Gal. 5 7 10	
Each \$3 00 4 60 4 85	
Belle, Barrel.....65 & 7 1/2%	
Common Dash.	
Gal. 5 7	
Per doz.....\$17 00 19 00	

Adjustable.	
Martin's	30%
No. 63, Screw.....	20%

Cabinet.	
Screw	20%

Carpenters'.	
Steel Bar...List price plus 20%	

Carriage Makers'.	
2 1/2-inch.....per doz.	\$ 7 00
5 - "	14 00
8 - "	28 00
12 - "	42 00

Quilt Frame.	
No. 30, Ball and Socket, 2 1/4-in. head, per gross	\$13 00
No. 50, Ball and Socket, 3 1/2-in. head, per gross	14 50

Hose.	
Sherman's, brass, 1/4-inch, per doz.....	\$0 48
Double, brass, 1/4-inch, per doz.....	1 20

Saw Fliers.	
Wentworth's, No. 1, \$12.50; No. 2, \$18.25; No. 3, \$16.25.	

CLAWS, TACK.	
Wood hdl. No. 10...per doz.	\$1 15
Forged steel, wood hdl. "	2 15
Solid steel	3 25
Giant	50

CLEAVERS.	
Family.	
Beatty's, inch .. 7 8 9 10	
Per doz. \$27 00 29 00 33 00 36 00	

CLEAVES.	
Malleable	10c 1b.

CLIPPERS.	
Bolt (Carolus).	
No. 0.....	\$2 50
No. 1.....	3 25
No. 3.....	4 25

CLIPS.	
Axle65 @ 5%

Damper.	
Standard	per doz. 70c
Troy	38c
Hame	50c

COLLARS, STOVE PIPE.	
Lacquered.	
Inches	5 6 7
Fancy pattern, per doz.....	.65c 75c \$1 00

COMPASSES.	
Carpenters'	15%

COPPERS—Soldering.	
Pointed Roofing.	
3 lb. and heavier...per lb.	40c
2 lb.....	48c
2 1/2 lb.....	45c
1 1/2 lb.....	55c
1 lb.....	60c

CORD.	
Picture.	
White Wire.....	.60 & 5%
Sash.	
Spot, No. 7.....per lb.	65c
No. 8.....	60c

COTTERS, SPRING.	
All sizes.....	.87 1/2%

COUPLINGS, HOSE.	
Brass.....per doz.	\$2 25

CRADLES, GRAIN.	
Morgan's Grapevine, per doz.	\$45 00

CUT-OFFS.	
Standard gauge.....	.35%
26 gauge.....	.20%

CUTTERS.	
Glass.	
Red Devil.....	Net

Meat.	
Enterprise—Nos. 5 10 12	
Each \$2 50 \$4 25 \$3 75	
Nos. 22 32	
" \$6 50 \$8 50	

Pipe.	
Saunders, Nos. 1 2 3	
Each \$1 85 2 75 6 75	

Slaw and Kraut.	
4-knife Kraut.....	\$20 00-55 00

3-knife Kraut.	
8x77 in.	13 00-18 00
1-knife Slaw.....	2 50
2-knife Slaw.....	3 00

Washer	
	11 00

DAMPERS, STOVE PIPE.	
Diamond.	
6-inch.....per doz.	\$1 50

DIGGERS.	
Post Hole.	
Eureka.....per doz.	\$14 50

Iwan's Split Handle (Eureka)	
4-ft. Handle...per doz.	15 00
7-ft. Handle...per doz.	20 00

Iwan's Hercules pattern, per doz.....	
	18 00
Dividers, Wing25%

DRILLS.	
Bench.	
Blacksmiths' Tread (New List)	40%

Breast.	
Millers Falls No. 12, per doz.	\$52 50
Millers Falls No. 112, per doz.	32 00

Hand.	
Goodell's Automatic.	
No. 01.....each	\$1 60
No. 03.....	2 00
Goodell-Pratt No. 4 1/2, each	3 00
Goodell-Pratt No. 379, "	4 00

Reciprocating.	
Goodell's	3 20

DRIVERS, SCREW.	
Standard	
Lock Ferrule	"
Clark's Interchangeable....	"
Goodell's Spiral.....	"
Yankee Ratchet	"
" Spiral	"

EAVES TROUGH.	
70-20% off Standard List.	
Milcor	Net

ELBOWS—Conductor Pipe.	
Galvanized Steel, Tin and Terna.	
Plain Round or Round Corrugated.	
2 to 6 inch, Std. gauge. .60-10-5%	
2 to 6 inch, 26 gauge.....	40-10-5%
2 to 6 inch, 24 gauge.....	15-10-5%
Milcor	Net

Square Corrugated.	
Standard gauge.....	45-10-5%
26 gauge.....	30-10-5%
Milcor	Net

ELBOWS—Stove Pipe.	
1-piece Corrugated, Uniform.	
Dos.	
5-inch	\$1 50
6-inch	1 60
7-inch	2 10
Uniform, Collar Adjustable.	
Dos.	
5-inch	\$1 90
6-inch	2 00
7-inch	2 50

ENAMEL.	
Per doz.	
Black Silk Air Drying.	
No. 1, 1/2 pt. can with brush	\$1 92
No. 2, 1 pt. can with brush	3 50

Wire Screen Enamel.	
Black Silk (Black only).	
Per doz.	
1/2 pt. friction top can....	\$2 00
1 pt. friction top can.....	3 00
1 qt. friction top can.....	5 40

FACES, WOOD.	
50% off list.	

FASTENERS, STORM SASH.	
Schroeder's	per doz. \$1 50
Sensible	3 00

FENCING.	
Lawn fence, single space,	
36-inch	\$ 9 12
Lawn fence, single space,	
42-inch	10 36
Lawn fence, double space,	
36-inch	12 64
Lawn fence, double space,	
42-inch	13 78</

GALVANIZED WARE.		HANDLES.		Screw Hook and Strap.		KETTLES.	
Per doz.		Agricultural Tool.		6 to 12 in...per 100 lbs.		Brass	
Pails (Competition), 8-qt...\$2 00		4 1/2-inch, plain...per doz. \$3 50		14 to 20 in.... " " 7 50		Cauldron	
10-qt. 2 55		Auger.		22 to 36 in.... " " 7 25		Copper	
12-qt. 2 50		Common Assorted, per doz. \$0 75		Screw Hook and Eye.		Maslin	
14-qt. 2 80		Pratt's Adjustable, Nos.		1/2 in.....per doz. pair \$2 00		Sugar	
Wash tubs, No. 1..... 6 50		1 & 2, per doz..... 6 00		1/2 in..... " " 3 50		50%	
No. 2..... 7 50		Ives' Adjustable...per set 1 35		1/2 in..... " " 5 00			
No. 3..... 8 50		Axe.		HOES.		KNIVES.	
GARAGE DOOR HARDWARE.		Hickory, No. 1....per doz. 4 00		Garden		Beet Topping.	
StanleyAll net		Hickory, No. 2.... " 2 50		Net		Clyde, 9-in. Scimitar Blade,	
GAUGES.		1st quality, second growth 6 00				doz. 25%	
Cream Pall.		Special white, 2nd growth. 5 00				California	
Fairmountper doz. \$3 75		Chisel.		HOOKS.		25%	
Marking, Mortise, etc.....		Hickory, Tanged, Firmer,		Awning, No. 60.....Net		Butcher.	
Nets		Assortedper doz. 55c		Belt.		Beechwood Handles, 6-inch	
Wire.		Hickory, Socket Firmer,		Brown's70&5%		blade	
Disston's25%		Assortedper doz. 70c		Jones'65&5%		Beechwood Handles, 7-inch	
GIMLETS.		Coal Pick.....40%		Box.		blade	
Discount.....65% and 10%		Drifting Pick.....40%		No. 8 10 12		Beechwood Handles, 8-inch	
GLASS.		File, assorted.....per doz. 30c		Each\$0 29 0 77 0 86		blade	
Single Strength, A and B,		Hammer and Hatchet.		Bush.		Cooper's Hoop	
all sizes.....81%		No. 1, per doz.....\$0 80		Common Axe Handle,		Corn.	
Double Strength, A and B,		Second growth hickory, per		per doz.....\$20 00		Clipper	
all sizes.....83%		doz. 1 40		Chain.		Disston's No. 2.....25%	
GLOVES.		Hay and Manure Fork, Han-		Inch.. 1/4 5/16 3/8 7/16 1/2		Earle's25%	
Per doz.		dles, Strap and Ferrule...		Pr. 100 \$7 60-8 10 9 75 11 50 12 60		Woodford25%	
6-oz. knit wrist gloves.....\$1 00		Screw Driver.		Clothes Line.		Drawing.	
8-oz. knit wrist gloves.....1 20		Assortedeach 6c		Japanned ...per doz. 35c@1 00		Standard25%	
10-oz. knit wrist gloves.....1 45		Shovel and Spade.....Net		Galvanized .. " 65c@2 25		Adjustable25%	
GLUE.		Door.		Conductor.		Barton's Carpenters'.....25%	
Bulk.		MatchlessNet		Conductor hooks.....20-10%		Hay.	
B Amber.....per lb. 35c		ReliableNet		MilcorNet		Iwan's Solid Socket.....25%	
A white..... " 40c		Richards25%		Corn.		Heath's25%	
H. S. Amber..... " 32c		Garage Door.		Common, riveted, red, per dz. Net		Iwan's, Sickle Edge.....25%	
Liquid.		(See Garage Door Hdw.)		Little Giant..... " "		Iwan's Imp'd Serrated.....25%	
Army & Navy.....40%		Conductor Pipe.		Grass.		Hedge.	
Le Page's—		Iwan's Perfection.....50%		Common Nos. 1 2 5 7		Challenge25%	
List "A".....37 1/2%		Milcor Perfection.....Net		Per doz..\$4 25 3 25 3 40 3 50		Disston's No. 1.....25%	
List "B".....35%		Eaves Trough.		Hammock.		Mining.	
List "C".....25%		Steel hangers.....30%		With plate.....per doz. \$1 00		Common, Single25%	
GREASE, AXLE.		Triple twist wire.....10%		With screw..... " 95		Common, Double25%	
Wood Boxes.		Milcor Eclipse.....Net		Picture50%&50%&10%		Streeter, 4-blade25%	
Frazer'sper gro. \$13 00		Milcor Triplex.....Net		Potato and Manure.....Nets		Streeter, 6-blade25%	
Hub Lightning..... 7 50		Milcor Milwaukee.....Net		HOSE.		Putty.	
Wood Pails.		HASPS.		Per ft.		Common25%	
Frazer's, 15 lb. \$1.00; 25 lb. \$1.50		Hinge, Wrought, with staples.Net		1/2-inch molded reel.....15c		Landers25%	
each.		HATCHETS.		1/2-inch 3 ply duck.....15c		Scraping.	
Hub Lightning, 15 lb. 90c; 25 lb.		Size No. 2 extra quality		1/2-inch 4 ply duck.....17 1/2c		Beech Handle25%	
\$1.21 each.		Per doz.		1/2-inch 5 ply multiple.....13c		Lander's25%	
GRINDSTONES.		broad\$19 00		Boss.		Doors.	
Family.		Competitive Grade..... 13 00 up		Nos. B E		Mineralper doz. \$2 00	
Inches 7 8 10 12		No. 2 Warranted Shingling 14 25		Per doz.New Nets		Porcelain " 2 00	
Prices on application.		Competitive Forged..... 9 75		No. 59....per doz. New Nets		Jet " 2 00	
Mounted.		HINGES.		Plane.		LADDERS.	
Ball Bearing... 1 2 3		Blind.		Wood Bench...Add 10% to list		Common, per ft.....23c	
Prices on application.		Clark's Gravity		IRONs.		Common, with Shelf, add 10c.	
GUNS.		No. 1.....per set 45c		Charcoalper doz. \$11.00		IXL34c	
Iver Johnson Champion Single		No. 2..... " 88c		Common, polished, per		Challenge, 6 to 9 ft.....55c	
Barrel Shot Guns.....Net		Gate.		100 lbs. 7 75		10 to 16 ft.....60c	
Double Barrel, Hammerless....		Clarks..... 1 2 3		No. 70 Asbestos.....\$1 50 net		LANTERNS.	
HAFTS, AWL.		Hgs & Lch, ea. 85c 1 10 2 40		No. 100 " 1 75 net		Per doz.	
Brad.		Hinges only—		Common, nickel plated.... 8 25		Monarch tin, hot blast....\$ 9 50	
Commonper doz. \$0 35		Upper\$1 25		Mrs. Pott's,		Dietz No. 2 cold blast..... 14 50	
Peg.		Lower 1 55		No. 50 J, Enterprise, per set Nets		Best tubular 9 50	
Patent, plain top. " 60		Latches only—		No. 55 J, " " " "		Competition lanterns No. 0	
Patent, leather top " 80		No. 1.....each 28c		No. 50 T, " " " "		tubular 7 80	
Sewing.		No. 2..... " 28c		Wagon.		LEATHER, LACE.	
Common " 24		Screen Door.		Richard's No. 1...per doz. \$15 50		Rawhide 1/2-inch ...100 ft. \$2 60	
Patent " 55		1751—3x3doz. \$2 00		Oliver,		1/2-inch " 4 40	
HAMMERS, HANDLED.		1753—2 1/2x2 1/2 1 95		No. 0 00		LEATHERS, PUMP.	
Each, net		Spring.		Each\$0 60 \$0 80		Valve and Plunger.....Net	
Blacksmiths, Hand, No. 0,		Chicago Add 10% to list		Standard,		LEVELS.	
26 oz.\$1 35		Gem25%		Nos. 1 2		Disston, No. 28 Asst.....\$22 05	
Engineers', No. 1, 26 oz..... 1 35		Matchless40%		Each\$0 60 \$1 00		" No. 18, 20 in. each 1 83	
Farriers', No. 7, 7 oz..... 1 41		New Idea.....per gross \$6 90		Big Lift.....40%		" No. 22, 24 in. each 2 40	
Machinists', No. 1, 7 oz..... 1 06		Wrought Iron.		Tiger40%		" Shafting, 6 in..... 19 80	
Nail.		Per 100 pairs with screws:				" 6 in. gr. glass 24 20	
Vanadium, No. 4 1/2, 16 oz.,		Light Strap Hinges, No. 3 \$12 00				" No. 1 Asst..... 5 75	
each 1 56		Heavy Strap Hinges, No. 4 15 75				" No. 9 Asst..... 12 40	
V. & B., No. 11 1/2, 16 oz.,		Light T Hinges...No.3 12 10				" 24-26 in.each 1 03	
each 1 13		Heavy T Hinges...No.4 20 00				" 28-30 in.each 1 09	
Garden City, No. 11 1/2, 16		Extra Heavy T Hinges,				LIFTERS.	
oz., each 94		No.4 21 50				Stove Cover.	
Tinner's Riveting, No. 1, 8						Copperedper gro. \$6 00	
oz., each 80						Alaska " 4 75	
Shoe, Steel, No. 1, 13 oz.,						Transom.	
each 73						Payson's55%	
Tack.						LINES.	
Magnetic.						Juteper lb. 25c	
No. 6, each..... 1 00						Sisal " 35c	
HAMMERS, HEAVY.						Cotton " 25c	
Farriers'20%						Braided Cotton..... " 52c	
Masons'.							
Single and Double Face.....50%							

LINING, STOVE.

Bricksper crate 42c

LOCKS.

Barn Door.
No. 60 Stearns...per doz. \$12 00
No. 80 " " " 24 00

MACHINES.

Riveting.
Stearns No. 1...per doz. \$16 00

Tenoning.

No. 50 Peace's Spoke, each \$16 00

MAIL BOXES.

See Boxes.

MALLETS.

Carpenters'.
Fibre Head, No. 2 per doz. \$16 50
" No. 3 " 19 50
" No. 4 " 28 50

Round Hickory
.....per doz. \$3 00—5 00
Round Lig-
numvitae " 6 25—10 50
Square Hickory " 3 50—5 50
Square Lig-
numvitae " 8 00—12 00

Tinners'.

Hickoryper doz. \$2 25

MATS.

Door.
National Rigid.....5&10&5%
Acme Steel Flexible.....50%

MAULS.

Wood Choppers'.
Lake Superior & Oregon
pat.40&5%

MEASURES.

Galvanized, doz.....Nets
Japanned, doz.....Nets

MITRES.

Galvanized steel mitres, end
caps, end pieces, outlets....30%
MilcorNet

MOPS.

Cotton. Star (Cut Ends).
Pounds 12' 15' 18' 24'-3-oz.
Per doz. \$4 50 5 65 6 75 9 00
Enterprise16%
Parker50&5%

NAILS.

Cut Steel.....\$4 25

Cut Iron.....4 45

Wire.
Commo.3 75

Cement Coated.
Small Lots.....4 20

Horseshoe.
Ausable55&5%
Capewell15%
Perfect55&5%
Putnam20&5%
Star30&5%

Picture.
Brass Heads.....25%

Brads50&5%
FurnitureList plus 15%

NAIL PULLERS.

See Pullers.

NAIL SETS.

See Sets.

NETTING, POULTRY.

Galvanized before weaving....50%
Galvanized after weaving....40%

NIPPERS.

End Cutting.
Berg's (Swedish) In. 5 6
Per dozen.....\$12 60 15 20

End and Diagonal Cutting.
Berg's (Swedish) In. 5 6
Per dozen.....\$10 05 12 00

Hoof.

Heller's40&10%
V. & B. No. 52, each.....\$2 25

NOZZLES.

Hose.
Magicper doz. \$9 50
Diamond8 75

NUTS, HOT PRESSED.

Square Tapped.
\$2.41 off per 100 lbs.

Hexagon Tapped.
\$2.41 off per 100 lbs.

OILERS.

Chase Pattern.
Brass and Copper.....10%
Zinc20%

Railroad.
Coppered22 1/2%

Steel.
Copper Plated50-10-5%

OPENERS.

Can.
Delmonicoper doz. \$1 30
Never Slip.....65

Crate.
V. & B....per doz. \$7 25-11 00

OUTFITS, COBBLING.

Combinationper doz. \$16 00
Economy8 50
Family14 50

PAIS.

Cream.
14-qt. without gauge
.....per doz. \$9 50
18-qt. without gauge,
.....per doz. 11 00
20-qt. without gauge,
.....per doz. 11 75

Sap.
10-qt., IC Tin...per doz. \$4 00
12 " " " " 5 50

Stock.
Galv. qts. 14 16 18 20
Per doz. \$9 75 10 75 12 75 14 50

Water.
Galv. qts. 10 12 14
Per doz. \$5 75 6 50 7 25

Wood.
Cable, 2-Hoop...per doz. Nets
Cable, 3-Hoop... " Nets
Cedar, 3-Hoop, brass " Nets

FANS.

DrippingNet

Fry.
CommonNets
Acme " "

Roasting.
Paxton,
Nos.1 2 3 4
Per doz.Nets
Neverburn " "

Savory, No. 200...per doz. \$8 40

PAPER.

Roofing. Per square.
Major, 1-ply\$1 33
" 2-ply2 24
" 3-ply2 65
Red Rosin.....per ton \$111 45

Sand and Emery.
No. 1 per ream, best grade \$5 40
No. 1, per ream, cheaper
grade4 35

PARERS.

Apple.
Goodell'sper doz. \$10 80
Turntable11 40
White Mountain " 8 40
Reading No. 78 " 11 40

Potato.

Goodell's Saratoga, 10 1/2
in., doz.6 50
Goodell's Saratoga, 5 in.,
doz.5 50

PICKS.

Adze Eye Ore.....22 1/2%
Drifting and Poll Picks....22 1/2%
Plumbs, Railroad22 1/2%
Surface22 1/2%

PINCERS.

Carpenters', cast steel,
No.6 8 10 12
Each \$0 56 \$0 72 \$0 93 \$1 02
Blacksmiths', No. 10.....\$0 96
Heller'sList plus 10%

PINS.

Clothes.
Common, per box of 5 gro. \$0 95

Picket.

Fluted, 15-in.....per doz. \$1 10
Fluted, 21-in.....1 60
Spiral1 90

PIPE.

Conductor.
Plain Round and Round Corru-
gated.
29 Gauge55%
28 "45%
26 "35%
24 "10%

Square Corrugated A and B and
Octagon.
29 Gauge40%
28 "40%
26 "30%
24 "10%

Galvanized Toncan Metal, Genu-
ine O. H. Iron, Lyonmore
Metal, Charcoal Iron and Key-
stone C. B.

Plain Round and Round Corru-
gated.
29 Gauge40%
26 "35%
24 "10%

Square Corrugated A and B
Polygon and Octagon.
29 Gauge40%
26 "30%
24 "10%

14 and 16-oz. Copper, all de-
signs10%
Milcor, all styles and gauges..Net

Standard Gauge.
Crated and nested.....60-25%
Crated, not nested.....60-20%

Portico Elbows.

Standard Gauge Conductor Pipe,
plain or corrugated.
Not Nested60 & 10%
Nested solid60 & 15%

Stove.

Per 100 joints.
26 gauge, 5 inch E. C.
nested\$14 50
26 gauge, 6 inch E. C.
nested15 50
26 gauge, 7 inch E. C.
nested17 50
28 gauge, 5 inch E. C.
nested12 50
28 gauge, 6 inch E. C.
nested13 50
28 gauge, 7 inch E. C.
nested15 50
30 gauge, 5 inch E. C.
nested11 00
30 gauge, 6 inch E. C.
nested12 00
30 gauge, 7 inch E. C.
nested14 00
T-Joint Made up.
6-inchper 100 \$40 00

Furnace Pipe.

Double Wall Pipe and Fit-
tings40%
Single Wall Pipe, Round
Pipe Fittings40%
Galvanized and Back Iron
Pipe, Shoes, etc.40%
Milcor, galvanized.....Net

PLANES.

Stanley Iron Bench.....Net

PLIERS.

V. & B. No. 6.....each \$0 57
" No. 7 Gas.....0 60
" Double Duty 106...0 55
" Nut No. 3.....0 64

Lineman's Side Cutting.

Berg's
(Swedish), In. 6 7 8
Blk. Pol. Face,
doz.\$10 70 20 00 23 35

Long Nose Side Cutting.

Berg's (Swedish) In. 5 6
Blk. Pol. Face, doz. \$12 25 15 20

Flat and Round Nose.

Berg's (Swedish)
Flat, In. 4 6 8
Blk. Pol. Face,
Doz.\$8 90 13 35 19 65
Berg's (Swedish)
Round, In. 4 6 8
Blk. Pol. Face
Doz.\$11 15 16 30 23 35

POINTS, GLAZIERS.

No. 1, 2 and 3.....per doz. 75c

POINTERS, SPOKE.

Stearns' No. 1.....per doz. \$10 00
" No. 2.....12 00

POKERS, STOVE.

Wrt Steel, str't or bent,
.....per doz. \$0 75
Nickel Plated, coil han'l's " 1 10

POLISH.

Metal. Per doz.
Black Silk No. 60—6 oz. ...\$ 1 50
Black Silk No. 70—1 pt. ...3 00
Black Silk No. 80—1 qt. ...5 00
Black Silk No. 90—1 gal. ...12 00

Stove.

Per doz.
Black Silk No. 5 paste, 5
oz. can\$ 1 20
Black Silk No. 10 paste,
1/2 lb. can.....2 00
Black Silk No. 10A paste,
(fireproof), 1 1/2 lb. can. 1 50
Black Silk No. 15 paste, 1
lb. can3 00
Black Silk No. 20 paste,
5 lb. can.....11 40
Black Silk No. 6 liquid, 6
oz. can1 35
Black Silk No. 8 liquid,
1/2 pt. can.....2 00
Black Silk No. 12 liquid,
1 pt. can.....3 00

PRESSES, FRUIT AND JELLY

Enterprise Manufacturing Co. 25%

PRUNERS.

Disston's Pole....per doz. \$13 00
Water's Improved, per doz. 60%

PULLERS.

Cork.
Daisyeach \$3 10
Phoenix1 40
Quick and Easy.....2 70

Nail.
Giantper doz. \$14 50
Never-Slip17 00

PULLEYS.

Awning—Jap'd10%

Clothes Line10%

Hay Fork.

Iron Wheel, 5-in..per doz. \$2 50
Wood Wheel, 6-in. " 2 65
Wood Wheel, 6-in.,
pass knot " 3 00

Sash.

CommonNet
Common-Sense, 2-in.....Net
Empire Pattern, 2-in.....Net
IdealNet
SteelNet

PUMPS.

Spray.
Midget Junior....per doz. \$3 75
New Misty6 00
Crescent6 50

PUNCHES.

Conductors. No. 22.....per doz. \$3 00

Machineper lb. 25

Saddlers'.

Common....per doz. \$1 50 to \$5 00
Revolving Spring.
Stearns, No. 10...per doz. \$ 8 00
" No. 40... " 16 00
" No. 60... " 19 00

Parker Metal Punch No.

OXeach \$7 00

Whitney's Ball-bearing...

.....Prices on application

PUTTY.
Commercial Putty, 100-lb.
kits\$4 75

RAIL.
Barn Door.
Matchless, 1-in. 5c
Matchless, 1 1/4-in. 7c
Storm King 5c

Sliding Door.
Bronzed wrought iron,
..... per ft. 8 1/4c

RAKES.
Garden. Per doz.
Steel, Bow, 12-in. Teeth...\$8 50
Steel, Bow, 14-inch " ... 9 25
Malleable Iron, 12-in. " ... 4 75
Malleable Iron, 14-in. " ... 5 00

Hay.
Wood, 10 Teeth.....\$4 00

Lawn.
20 Teethper doz. 5 50

RAZORS—SAFETY.
Gilletteper doz. \$45 00
Auto Strop 45 00
Gem 8 40
Gem (3 doz. lots) .. 8 00
Ever Ready 8 40
Ever Ready (3 dz. lots) " 8 00

RAZORS—STRAIGHT.

RAZOR STROPS.
Star (Honing)50%

REGISTERS.
Cast Iron20%
Steel and Semi-Steel.....30%
Baseboard30%
Adjustable Ceiling Ventilators 30%

REGISTER FACES.
Japanned, Bronzed and Plated.
4x6 to 14x14.....30%
14x14 to 38x42.....50%

REVOLVERS.
Iver Johnson Safety Automatic
HammerNet
Hammerless
I. J. Model 199.....

RIDGE ROLL.
Galvanized.
Crated70-25%
Wired70-25-5%
MilcorNet

RINGS AND RINGERS.
Pull.
Copper2 1/2-in. 3-in.
Per doz.....\$2 40 \$2 65
Rea's Improved Self-
Piercing copper,
..... doz. 3 40
Steel, per doz..... 1 50 1 80

Hog.
Blair's Rings.....per doz. \$ 75
Blair's Ringers..... " 1 00
Brown's Ringers... " 72
Brown's Ringers... " 1 00
Hill's Ringers..... " 1 00
Hill's Ring, boxes " 72
Major Rings " 60
Perfect Ringers... " 1 50
Wolverine Rings.. " 1 10
Wolverine Ringers " 1 10

Fruit Jar.
Whiteper lb. 30

Key.
Split, round.....per doz. \$0 17
Split, square..... " 32
Ball, round..... " 40

RIVETS.
Copper Belt....Add 15% to list
Coppered Iron30%
Tinners'30%

Name......per lb. \$0 17

Slotted Clinch per doz. 60@1 10
Tubular.
Nos. 1 and 2 assorted sizes,
50 in box.....doz. 75c
Nos. 1 and 2 assorted sizes,
10 in box.....doz. 1 40

ROPE.
Cotton.
1/4, 5-16 in. Com. on reels,
per lb. 80c
1/4, 5-16 in. Com. in coils,
per lb. 80c

Sisal.
1st Quality, base, 12 1/2c to 14 1/2c
No. 211 1/2c to 13 1/2c

Manilla.
1st quality standard
brands15 1/2c to 16 1/2c
No. 214 1/2c to 15 1/2c

Pure Manilla.
1st quality, base, per lb.
.....17 1/2c to 18 1/2c
Hardware Grade, per lb.
.....16 1/2c to 17 1/2c

SAWS.
Butchers'.
Atkins No. 2, 14-in.....\$12 20
" No. 2, 18-in..... 13 70
" No. 2, 22-in..... 15 25
" No. 7, 16-in..... 15 20
" No. 7, 20-in..... 19 35
" No. 7, 24-in..... 21 40
" No. 7, 28-in..... 24 00
Disston's No. 2, 14-in..... 18 20
" No. 2, 18-in..... 19 50
" No. 2, 22-in..... 20 85
" No. 7, 16-in..... 20 00
" No. 7, 20-in..... 21 35
" No. 7, 24-in..... 23 35
" No. 7, 28-in..... 26 00

Compass.
Atkins No. 2, 10-in.....\$ 4 95
" No. 10, 10-in..... 5 10
" Blades, No. 2, 10 in. 2 95
" No. 2, 10-in. 3 00
Disston's No. 20 Jackson. 4 00
" No. 40 Sampson 2 50
" No. 2 & 77, 10-in. 6 05
" No. 9, 10-in..... 6 80

Cross-Cut.
Atkins No. 221, 4-ft..... 2 70
" No. 221, 6-ft..... 4 10
" No. 221, 8-ft..... 5 45
Disston's No. 229, 4-ft..... 3 15
" No. 229, 6-ft..... 6 15
" No. 229, 8-ft..... 10 65

Flooring.
Atkins No. 96, 16-in..... 19 95
" No. 96, 20-in..... 21 85
Disston's D19, 16-in..... 24 50
" D19, 20-in..... 31 00

Hand and Rip.
Atkins No. 54, 20-in..... 17 75
" No. 54, 26-in..... 22 10
" No. 53, 16-in..... 16 45
" No. 53, 20-in..... 20 80
" No. 53, 24-in..... 24 20
" No. 53, 28-in..... 28 60
" No. 53, 30-in..... 31 95
Disston's No. 7, 20-in..... 19 30
" No. 7, 32-in..... 35 40
" No. 8, 16-in..... 17 55
" No. 8, 20-in..... 20 75
" No. 8, 24-in..... 24 40
" No. 8, 28-in..... 29 50
" No. 8, 30-in..... 32 95

Keyhole.
Atkins No. 1, complete... 2 80
" No. 2, complete... 3 35
Disston's No. 5, complete 3 35
" No. 10, complete 3 70
" No. 95, complete 5 75

Miter Box.
Atkins No. 1, 4x20..... 29 70
" No. 1, 5x22..... 34 55
" No. 1, 6x22..... 38 35
Disston's No. 4, 4x20-in. 36 15
" No. 4, 5x22-in. 43 25
" No. 4, 6x22-in. 47 20

Pruning.
Atkins No. 20, 12-in..... 7 70
" No. 10, 16-in..... 16 50
Disston's No. 20..... 18 75

Wood.
Atkins No. 202..... 8 50
" No. 318..... 10 05
" No. 906..... 15 65
" No. 1509..... 18 40
Disston's No. 111, 30-in. 22 20
" No. 111, 32-in. 22 75
" No. 47, 32-in. 20 25
" No. 47, 32-in. 20 80

SCISSORS.
Star60%

SCOOPS.
Hubbard Western Pattern Riveted.
Size A B C D
1.. \$16 75 16 00 15 25 14 45
4.. 17 85 17 10 16 35 15 60
6.. 18 65 17 85 17 10 16 35

SCRAPERS.
Box.
Triangular, No. 6 per doz. \$6 25

Road.
Cubic ft. 7 5 3
With runners, ea. \$7 00 6 50 6 20

SCREEN DOOR HINGES.
Cast irongross \$13 00
Steel 9 50

SCREWS.
Bench.
Iron, ins. 1 1/4 1 1/2 1 3/4
..... \$6 82 7 87 9 45 16 80
Wood, white maple, per doz. 6 00

Hand—Wood50%

Hand Rail22%

Jack30%

Lag or Coach—all sizes, gimlet
pointed45-50%

Saw—Centennial.
Nos. 1 2 3 4
Per doz.....47c 55c 75c 90c

Wood.
F. H. Bright77 1/2-20%
R. H. Blued75-20%
F. H. Jap'd70-20%
F. H. Brass72 1/2-20%
R. H. Brass70-20%

SCYTHES.
Clipper, Grass.....per doz. \$13 50
Honest Dutchman.. " 13 00

SETS.
Nail.
Square head.....per doz. 1 84
Cup point, knurled " 1 78

Rivet.
Farmers'per doz. 2 50
Tinners' 3-4 5 75
" 00-0 8 75

Saw.
Atkins No. 10.....per doz. \$8 80
" No. 12..... " 6 20

Disston's Monarch
No. 2..... " 9 90
Disston's Monarch
No. 12 " 13 20
Leach's " 80
Nash's Hand " 3 15
Nash's X-cut " 4 20
Stillman's Lever.. " 1 30
Stillman's X-cut.. " 2 50
Whiting Pattern, " 7 50
No. 21
Eccentric Anvil,
Hand No. 395,
N. P. Morrill Pat-
tern " 14 50

SHARPENERS, SKATE.
Diamondper doz. \$1 60
Perfect 1 20

SHEARS Per Doz.
Nickel Plated, Straight, 6" \$12 90
" " " 7" 14 85
" " " 8" 16 20
Japanned, Straight 6" 11 00
" " " 7" 12 40
" " " 8" 13 80

SHEAVES, SLIDING DOOR.
Common.
Inches 3 4 5
Per set\$1 40 1 75 2 40

Hatfield's.
Per set \$1 80 2 10 2 75 25

SHELLERS, CORN.
Unionper doz. \$6 75

SHIELDS.
Expansion Bolt Shields.....60%

SHINGLES. Per Square
Zinc (Illinois) \$15 00

SHOES.
Conductor60%

SHOT—See Ammunition.

SHOVELS AND SPADES.
Coal.
Hubbard's
No. A B C D
1 \$16 00 15 10 14 45 13 70
2 16 35 15 60 14 85 14 10
3 16 75 16 00 15 25 14 45
4 17 10 16 35 15 60 14 85

Post Drains & Ditching.
Hubbard's
Size A B C
14" 17 15 16 40 15 65
16" 17 50 16 75 16 00
18" 17 85 17 10 16 35
20" 18 20 17 45 16 70
22" 18 55 17 80 17 05

Snow.
Hubbard Special,
Long Handle\$10 00
D-Handle 11 00
Sidewalk Scraper 6 50

Alaska Steel.
D-Handleper doz. \$3 50
Long Handle " 3 00

SINKS.
Cast Iron.
Painted, 16x24Net
Enameled, White, 16x24... "

Wrought Steel.
Painted, 16x24

SKATES. Per pair
Key Clamp Rocker, Men's
and Boys'—best steel
runners, bright finish..\$0 91
Same—nickel plated finish 1 13
Key Clamp Hockey, Men's
and Boys'—polished cast
steel runners 1 24
Children's Extension Bob.. 55
Half-key Clamp Rocker—
Women's and Girls'.... 1 15
Half-key Clamp Hockey—
Women's and Girls'.... 1 51
Racers, aluminum finish,
including shoes 9 00
Hockey, aluminum 9 00
Both same prices for men's and
women's.

Roller.
Ball Bearing—Boys' 2 25
Ball Bearing—Girls' 2 45

SNAPS, HARNESS.
Covered SpringAdd 30%
Judd's Pattern Add 33 1/4% to list

SNATHS.
Double Ring, Bush...per doz. \$9 75
Patent Loop, Bush.. " 10 00
Patent Loop, Grass. " 8 75

SNIPS, TINNERS'.
Clover Leaf40&10%
National40&10%
Star50%
MilcorNet

SPRINGS, DOOR.
Perfect.
Nos. 2 3 4 5 6 7
Per doz. 55c 60c 65c 75c 90c 1 00

Reliance.
Light Medium Heavy
Per doz...\$1 55 2 10 3 20
Torrey'sper doz. 1 65

SPRINKLERS, LAWN.
Stearn's No. 1....per doz. \$11 50

SQUARES.
Steel and Iron.....Net
(Add for bluing, \$3.00 per doz. net)

Mitre
Try
Try and Bevel.....
Try and Miter.....
Fox'sper doz. \$6 00
Winterbottom's10%

SQUEEZERS, LEMON.
Common Wood....per doz. \$0 70
Porcelain Lined, Wood " 1 25
Boss, malleable iron " 1 20
Iron frame porc'n
bowl " 1 90
Iron frame, glass
bowl " 2 35
Little Giant, tin'd
iron " 4 00
Drum, japanned ... " 3 60
Drum, nickel plated " 4 60

STAPLES.
Blind.
Barbedper lb. 21@22c
Butter, Tub " 16@19c

Fence—
Polishedper 100 lbs. \$5 45
Galvanized " 6 15

Netting.
Galvanizedper 100 lbs. 6 50

Wrought.
Wrought Staples, Hasps and
Staples, Hasps, Hooks and
Staples, and Hooks and
Staples50&10%
Extra heavy35%

STEELYARD.
Discount 25%.

STONES.
Axe.
Hindustanper lb. New Nets
More Grit " "
Washita " "

Emery.
No. 126.....per doz. New Nets

Oil—Mounted.
Arkansas Hard
No. 7.....per doz. New Nets
Arkansas Soft " "
Washita No. 717 " "

Oil—Unmounted.
Arkansas Hard per lb. New Nets
Arkansas Soft.. " "
Lilly White... " "
Queer Creek... " "
Washita " "

Seythe.
Black Diamond per gro. New Nets
Crescent " "
Green Mountain " "
LaMolle " "
Extra Quinne-
bog " "
Red End " "

STOPS, BENCH.
No. 10 Morrill pat-
ternper doz. \$11 00
No. 11 Stearns pat-
tern " 10 00
No. 15 Smith pattern " 7 00

STOPPERS, FLUE.
Commonper doz. \$1 10
Gem, flat, No. 3... " 1 00
Gem, No. 1..... " 1 10

STRAPS.
Skateper doz. 85c&1 20

STRETCHERS.

Carpet.	
Bullard's	per doz. \$3 90
Excelsior	" 5 25
Malleable Iron....	" 70
Perfection	" 6 30
King	" 4 50

Wire.

O. S. Elwood, No. 1 per doz. Nets	
O. S. Elwood, No. 2	" "

SWIVELS.

Malleable Iron	per lb. \$0 10
Wrought Steel	per gro. 4 50

TACKS.

Bill Posters' 6-oz., 25-lb. boxes.	
per lb.	15c
Upholsters' 6-oz., 25-lb.	
boxes, per lb.	15½c

TAPES, MEASURING.

Asses' Skin	List&40%
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THERMOMETERS.

Tin Case.....	per doz. 80c&\$ 1 25
Wood Back....	" \$2 00& 12 00
Glass.....	" 12 00

TIES.

Bale.	
Single Loop, carload	
lots	75&7%
Single Loop, less than	
car lots	70&15%

TOOLS, SAW.

Disston's Universal.....	10%
--------------------------	-----

TRAPS.

Game with Chains.	Per doz.
Victor No. 1.....	\$2 01
Onida Jump No. 1.....	2 75
Newhouse No. 1.....	5 62

Mouse and Rat.

List per gross.	
Sure Catch Mouse Traps..	\$ 3 70
Vim Mouse Traps.....	3 70
Short Stop Mouse Traps..	3 20
Wood Choker Mouse	
Traps, 4 hole.....	17 00
Sure Catch Rat Traps....	16 00
Vim Rat Traps.....	16 00
Short Stop Rat Trap....	15 00
Dead Easy Rat Traps....	17 00
Star Rat Traps.....	50 00
Erie	54 00

Packed in One Bushel Band Stave Baskets.

List per bushel.	
Sure Catch Mouse Traps	
(360 Traps)	\$ 9 30
Short Stop Mouse Traps	
(360 Traps)	8 00
Sure Catch Rat Traps (54	
Traps)	6 00
Short Stop Rat Traps (54	
Traps)	5 60

Assorted Mouse and Rat Traps.

List per bushel.	
Sure Catch (216 Mouse	
Traps and 26 Rat Traps) \$8	50
Short Stop (216 Mouse	
Traps and 26 Rat Traps) 7	50

TROWELS.

Cement.	
Atkins No. 6.....	19 50
" No. 9.....	25 50
Disston's	30%

TRUCKS.

Bag	each \$3 75
Warehouse or store,	
No. 1, each	\$24 50
No. 2, "	22 50

TUBS, WASH.

Standard, Wood.	Ex.
Nos. 3	2 1 large
Per doz. \$9 50	11 25 12 75 15 50

Galvanized.	
No. 1	2 3
Per doz.....	13 75 15 95 18 60

TWINE.

White Cotton.	
Eureka, 4-ply.....	per lb. 30c
Jute.	
3-ply and 6-ply Bale Lots.	22½c

VALLEY.

Formed Valley Galvanized	
Steel	60-5%
Milcor	Net

VISES.

No. 700, Hand,	
Inches 4½	5 5½
Doz.	\$11 15 13 00 14 85
No. 701, In. 4	5 6
Doz.	\$11 15 13 00 16 70
No. 1, Genuine Wentworth,	
Noiseless Saw.....	per doz. 15 00
No. 2, Genuine Wentworth,	
Noiseless Saw.....	per doz. 22 50
No. 3, Genuine Wentworth,	
Noiseless Saw.....	per doz. 25 00
No. 500, All Steel Folding	
Saw	per doz. 16 00

WASHERS.

Standard O. G. cast iron, per	
lb.	3½c
Wrought steel in 5-lb. boxes,	
per lb.	
In. 3/16	¼ 5/16 ¾ 1
15c 14c 12c 11c 10c	
9½c 9c 8c 8c	

WEDGES.

Ax.	per doz. Nets
Galling	per lb. Nets
Saw	per lb. 8½

WEANERS.

Calif.	
Fuller's, per doz. \$2 00 to \$2	5 50
Tyler's Safety, per	
doz.	1 85 to 2 40
Carroll's, per doz. 3 00 to	3 75
Hoosier, per doz. 3 50 to	4 60
Shaw Perfected.. 3 00 to	3 75

WEIGHTS.

Hitching	per lb. Nets
Sash—f. o. b. Chicago.	
Ton lots, per ton.....	\$42 50
Smaller lots, per ton....	45 00

WHEEL BARROWS.

Common Wood Tray.....	\$3 00
Steel Tray	4 50
Angle leg, garden.....	5 75

WHEELS.

Carborundum	50%
Emery	60%
Well, Ins.....	8 10 12
Per doz.....	\$5 50 7 25 8 50
12-in. heavy holisting,	
per doz.....	\$25 00

WIRE.

Black Annealed No. 8, per	
100 lbs.	\$3 25
Galvanized barb wire, per 100	
lbs.	4 15
Wire cloth—black painted,	
12-mesh, per 100 sq. ft..	2 50
Cattle Wire—galvanized	
catch weight spool, per	
100 lbs.	4 15
Galvanized Hog wire, 80 rod	
spool, per spool.....	3 60
Galvanized plain wire, per	
100 lbs.	3 75

WOOD FACES.

50% off list.

WRENCHES.

Coes Steel Handle, 6-inch....	30%
" " " 8 "	30%
" " " 10 "	30%
" " " 12 "	30%
Coes Knife-Handle, 6 "	30%
" " " 8 "	30%
" " " 10 "	30%
" " " 12 "	30%
Coes All Patterns.....	30%
Bemis & Call's:	
Adjustable S, 10% Adjustable	
S Pipe, 10%; Briggs'	
pattern	30%
Combination Bright	25%
Steel Handle Nut.....	30%
Combination Black	25&5%
Merrick Pattern	30%

Knife Handle Pattern.	
No. 62, Screw Wrench, List	
plus	30%
No. 60, Steel Handle.....	30%

WRINGERS.

No. 790, Guarantee, per doz.	\$60 00
No. 770, Bicycle ..	55 00
No. 670, Domestic ..	51 00
No. 110, Brighton ..	45 00
No. 750, Guarantee..	60 00
No. 740, Bicycle ..	55 00
No. 22, Pioneer ..	42 50
No. 2, Superb	30 00

ADVERTISERS' INDEX

The dash (—) indicates that the advertisement does not appear in this issue.

Abbott Mfg. Co.....	46
Ajax Bracket & Outlet Co.....	—
American Furnace Co.....	—
American Rolling Mill Co.....	—
American Steel & Wire Co.....	50
American Zinc Products Co.....	44
Ashton Mfg. Co.....	46
Berger Bros. Co.....	45
Bernz, Otto	—
Bertsch & Co.....	47
Black Diamond Furnace Co.....	4
Black Silk Stove Polish Co.....	—
Bullard & Gormley Co.....	48
Burgess Soldering Furnace Co.....	—
Burton Co., W. J.....	45
Carr Supply Co.....	9
Central Stove & Furnace Re-	
pair Co.....	11
Clark-Smith Hardware Co.....	46
Clayton & Lambert Mfg. Co.....	46
Cleveland & Buffalo Transit Co.	51
Cleveland Castings Pat. Co.....	11
Cleveland Eng. Inst.....	—
Coes Wrench Co.....	51
Cornish & Co., J. B.....	49
Cortright Metal Roofing Co.....	47
Curfman Mfg. Co., F. L.....	—
Dieckman Co., Ferdinand.....	—
Diener Mfg. Co., Geo. W.....	—
Double Blast Mfg. Co.....	—
Dreis & Krump Mfg. Co.....	47
Everhot Mfg. Co.....	—
Fanner Mfg. Co.....	—
Federal Varnish Co.....	49
Forest City Fdy. & Mfg. Co.....	—
Front Cover	
Friedley-Voshardt Co.....	44
G. & O. Mfg. Co.....	—
Geroch Bros. Mfg. Co.....	—
Hall-Neal Furnace Co.....	6
Harrington & King P'fg Co.....	45
Hart & Cooley Co.....	8
Haynes	—
Haynes-Langenberg Mfg. Co.....	—
Heller Bros. Co.....	50
Hemp & Co.....	47
Henry Furnace & Fdy. Co.....	9
Hessler Co., H. E.....	46
Hess-Snyder Co.....	5
Hones, Inc., Chas. A.....	—
Hoosier Stove Co.....	5
Hopson Co., W. C.....	47
Hultberg, John E.....	50
Hussey & Co., C. G.....	44
Hyfield Mfg. Co.....	51
Illinois Zinc Co.....	12
Independent Reg. & Mfg. Co.....	8
Independent Stove Co.....	—
Inland Steel Co.....	—
Kimball Bros. Co.....	43
Kirk-Latty Mfg. Co.....	11
Knoedler, Frederick J.....	—
Lalance & Grosjean Mfg. Co.....	—
Lemneck Co., W. E.....	—
Lennox Furnace Co.....	—
Lovell Mfg. Co.....	50
Lupton's Sons Co., David.....	44
Mahoning Fdy. Co.....	—
Malleable Iron Range Co.....	—
Manny Heating Supply Co., The	
Maplewood Machinery Co.....	47
Marsh Lumber Co.....	11
Marshalltown Mfg. Co.....	—
Melbye Bros.	11
Messenger & Parks Mfg. Co.....	46
Meyer & Bros. Co., F.....	7
Meyer Furnace Co.....	—
Meyers Mfg. Co., Fred J.....	—
Michigan Safety Furn. Pipe Co.	7
Milwaukee Corr. Co., Back Cover	
Monitor Stove Co., The.....	—
Monroe Fdy. & Furn. Co.....	—
Mt. Vernon Furnace & Mfg. Co.	5
National Stove Repair Co.....	11
North Bros. Mfg. Co.....	—
Northwestern Stove Repr. Co.....	11
Parker Supply Co.....	—
Peck, H. E.....	43
Peerless Fdy. Co.....	—
Penn. & Atlantic Seaboard	
Hdw. Assn.	10
Premier Warm Air Heater Co.....	—
Quick Meal Stove Co.....	—
Quincy Pattern Co.....	11
Rock Island Register Co.....	—
Roesch, Geo. E.....	43

Ross-Gould	43
Rudy Furnace Co.....	—
Rybolt Heater Co.....	5
Scheible-Moncrief Heater Co.....	—
Schill Bros. Co.....	4
Schwab & Sons Co., R. J.....	6
Shaw & Son Co., The Geo. E.....	11
Shiel Mfg. Co.....	51
Special Chemicals Co.....	—
Standard Furn. & Supply Co.....	6
Standard Ventilator Co.....	46
Stearns Register Co.....	3
St. Louis Tech. Inst.....	43
St. Louis Heating Co.....	2
Sullivan-Gieger Co.....	11
Sykes Co., The.....	45
Sylvan Sheet Metal Products	
Co.....	46
Taft Metal Pattern & Mfg. Co.....	—
Thatcher Furnace Co.....	2
Tuttle & Bailey Mfg. Co.....	—
Vaughan & Bushnell Mfg. Co.....	—
Vedder Pattern Works.....	11
Viking Shear Co.....	11
Walworth Run Fdy. Co.....	47
Waterloo Register Co.....	7
Wellman Supply Co., The.....	—
Whitney Mfg. Co., W. A.....	47
Whitney Metal Tool Co.....	47
Wise Furnace Co.....	—

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AMERICAN ARTISAN
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CLASSIFIED INDEX

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Chicago, Ill.	

Ball Ties.

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Chicago, Ill.	

Bearings—Damper.

Parker Supply Co.,	
New York, N. Y.	

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Cleveland Heights, Ohio	

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Maplewood Machinery Co.,	
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Hussey & Co., C. G.,	
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Bullard & Gormley, Chicago, Ill.	
----------------------------------	--

Cans—Copper.

Maxwell-Kunin Co., Chicago, Ill.	
----------------------------------	--

Castings—Malleable.

Fanner Mfg. Co., Cleveland, Ohio	
----------------------------------	--

Ceilings—Metal.

Burton Co., W. J., Detroit, Mich.	
Friedley-Voshardt Co.,	
Chicago, Ill.	
Hopson Co., W. C.,	
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Milwaukee Corrugating Co.,	
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Chain—Sash.

Parker Supply Co.,	
New York, N. Y.	

Chaplets.

Fanner Mfg. Co., Cleveland, Ohio	
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<p>Chisels. Vaughan & Bushnell Mfg. Co., Chicago, Ill.</p> <p>Clips—Damper. Carr Supply Co., Chicago, Ill. Waterloo Register Co., Waterloo, Iowa</p> <p>Closets—Chemical. Shiel Mfg. Co., Hillsdale, Mich.</p> <p>Coal Chutes. Peerless Foundry Co., Indianapolis, Ind. Sikes Co., The, Chicago, Ill.</p> <p>Cores—Auto Radiator. Curtman Mfg. Co., F. L., Maryville, Mo. G. & O. Mfg. Co., New Haven, Conn.</p> <p>Cornices. Burton Co., W. J., Detroit, Mich. Friedley-Voshardt Co., Chicago, Ill. Milwaukee Corrugating Co., Milwaukee, Wis.</p> <p>Cut-Offs—Rain Water. Sullivan-Geiger Co., Indianapolis, Ind.</p> <p>Doors—Fire. Messinger & Parks Mfg. Co., Aurora, Ill.</p> <p>Dry Paste. Carr Supply Co., Chicago, Ill.</p> <p>Dumb Waiters. Seagwick Machine Works, New York, N. Y.</p> <p>Eaves Trough. Abbott Mfg. Co., Cleveland, Ohio Berger Bros. Co., Philadelphia, Pa. Burton Co., The W. J., Detroit, Mich. Clark-Smith Hardware Co., Peoria, Ill. Lupton's Sons Co., David, Philadelphia, Pa. Milwaukee Corrugating Co., Milwaukee, Wis.</p> <p>Elbows and Shoes—Conductor. American Rolling Mill Co., Middletown, Ohio Dieckmann Co., Ferdinand, Cincinnati, Ohio Lupton's Sons Co., David, Philadelphia, Pa. Milwaukee Corrugating Co., Milwaukee, Wis.</p> <p>Elevators—Hand and Power. Kimball Bros. Co., Council Bluffs, Iowa Sedgwick Machine Works, New York, N. Y.</p> <p>Enamel—Iron. Black Silk Stove Polish Works, Sterling, Ill.</p> <p>Enamels—Wood. Cornish & Co., J. B., Chicago, Ill. Federal Varnish Co., Chicago, Ill.</p> <p>Fence Gates. American Steel & Wire Co., Chicago, Ill.</p> <p>Fenders. Meyers Mfg. Co., Fred J., Hamilton, Ohio</p> <p>Files. Heller Bros. Co., Newark, N. J.</p>	<p>Flux—Aluminum. Reesch, Geo. E., Aurora, Ill.</p> <p>Freezers—Ice Cream. North Bros. Mfg. Co., Philadelphia, Pa.</p> <p>Furnace Rings. Independent Reg. & Mfg. Co., Cleveland, Ohio Walworth Run Fdy. Co., Cleveland, Ohio</p> <p>Guards—Fire. Meyers Mfg. Co., Fred J., Hamilton, Ohio</p> <p>Hammers. Vaughan & Bushnell Mfg. Co., Chicago, Ill.</p> <p>Handles—Boiler. Berger Bros. Co., Philadelphia, Pa.</p> <p>Handles—File. Parker Supply Co., New York, N. Y.</p> <p>Hangers—Eaves Trough Abbott Mfg. Co., Cleveland, Ohio W. C. Hopson Co., Grand Rapids, Mich.</p> <p>Heaters—Hot Water. Thatcher Furnace Co., Chicago, Ill.</p> <p>Heaters—Combination Hot Water. Melbye Bros. Co., Chicago, Ill.</p> <p>Heaters—Coal and Wood. Hoosier Stove Co., Marion, Ind.</p> <p>Heaters—School Room. Haynes-Langenberg Mfg. Co., St. Louis, Mo. Meyer Furnace Co., Peoria, Ill. Monroe Fdy. & Furnace Co., Monroe, Mich. Peerless Foundry Co., Indianapolis, Ind. Standard Furnace & Supply Co., Omaha, Neb.</p> <p>Heaters—Warm Air. American Furnace Co., St. Louis, Mo. Black Diamond Furnace Co., Monmouth, Ill. Carr Supply Co., Chicago, Ill. Cooperative Foundry Co., Rochester, New York Forest City Fdy. & Mfg. Co., Cleveland, Ohio Haynes-Langenberg Mfg. Co., St. Louis, Mo. Hall-Neal Furnace Co., Indianapolis, Ind. 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Bullard & Gormley Co., Chicago, Ill. Clark-Smith Hardware Co., Peoria, Ill.</p> <p>Kitchen Utensils. Lalanc & Grosjean Mfg. Co., Chicago, Ill.</p> <p>Lath—Expanded Metal. Milwaukee Corrugating Co., Milwaukee, Wis.</p> <p>Machines—Crimping. Bertsch & Co., Cambridge City, Ind.</p> <p>Machinery—Culvert. Bertsch & Co., Cambridge City, Ind.</p> <p>Machines—Razor Blades. Hyfield Mfg. Co., New York, N. Y.</p> <p>Machines—Stove Pipe. Hemp & Co., St. Louis, Mo.</p> <p>Machines—Tinsmiths'. Bertsch & Co., Cambridge City, Ind. Dreis & Krump Mfg. Co., Chicago, Ill. Hemp & Co., St. Louis, Mo. Kniedler, Frederick J., Philadelphia, Pa. Maplewood Machinery Co., Chicago, Ill. Marshalltown Mfg. Co., Marshalltown, Iowa Whitney Mfg. Co., W. A., Rockford, Ill.</p> <p>Mailing Lists. Ross-Gould, St. Louis, Mo.</p> <p>Metals—Perforated. Harrington & King Perforating Co., Chicago, Ill.</p> <p>Miters. Friedley-Voshardt Co., Chicago, Ill.</p> <p>Nails—Slatting. Hussey & Co., C. G., Pittsburgh, Pa.</p> <p>Nails—Wire. American Steel & Wire Co., Chicago, Ill.</p> <p>Ornaments—Sheet Metal. Friedley-Voshardt Co., Chicago, Ill. Gerock Bros. Mfg. Co., St. Louis, Mo.</p>	<p>Patterns—Furnace and Stove. Cleveland Castings Pattern Co., Cleveland, Ohio Quincy Pattern Co., Quincy, Ill. Shaw & Son Co., The Geo. E., Cleveland, Ohio Taft Metal Pattern & Mfg. Co., Cleveland, Ohio Vedder Pattern Works, Troy, N. Y.</p> <p>Pipe and Fittings—Furnace. Carr Supply Co., Chicago, Ill. Henry Furnace & Fdy. Co., Cleveland, Ohio Lamneck Co., W. E., Columbus, Ohio Manny Heating Supply Co., Chicago, Ill. Meyer & Bro. Co., F., Peoria, Ill. Michigan Safety Furnace Pipe Co., Detroit, Mich. Standard Furnace & Supply Co., Omaha, Neb.</p> <p>Pipe and Fittings—Stove. Hemp & Co., St. Louis, Mo. Meyer & Bro. Co., F., Peoria, Ill. Sullivan-Geiger Co., Indianapolis, Ind.</p> <p>Pipe—Conductor. Berger Bros. Co., Philadelphia, Pa. Burton Co., W. J., Detroit, Mich. Clark-Smith Hdw. Co., Peoria, Ill. 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